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Ogarkov's Complaint and Gorbachev's Dilemma

The Soviet Defense Budget and Party-Military Conflict

Abraham S. Becker

December 1987

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→ This report attempts to illuminate the conflict within the Soviet Union between the Communist Party and the military high command over resource allocation in the early 1980s. It examines the measures of resource growth that the two sides could have used in the debate. It also considers Gorbachev's approach to the same problem in the last half of the 1980s and the connections between the two episodes. The author suggests that, in the future, Gorbachev's ability to maneuver may be limited by the growing harshness of military-Party relations. Furthermore, his failure to make good on his promises could aggravate the military-Party conflict.

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PREFACE

The present study was undertaken as part of a project on "Soviet Civil-Military Relations: The Possibilities for Policy Change," being conducted in the National Security Strategies Program of Project AIR FORCE. The report attempts to illuminate the conflict between the Party and the military high command over resource allocation in the early 1980s by examining the measures of resource growth that the two sides could have used in the debate. It also considers Gorbachev's approach to the same problem in the last half of the 1980s and the connections between the two episodes.

This study should be of interest to Air Force personnel and other members of the policymaking and intelligence communities concerned with the foundations of Soviet military power now and in the near future.

The author is grateful to Robert Campbell of Indiana University, Vladimir Treml of Duke University, and RAND colleague Steven Popper for careful reading and perceptive critiquing of an earlier draft.

SUMMARY

What is the connection between the CIA's finding of a virtual freeze on the growth of Soviet military procurement since the mid-1970s and the conflict between the armed forces, spearheaded by Marshal Ogarkov, and the Soviet Party leadership? How has that conflict been treated in the Gorbachev Politburo?

It is the speculative thesis of the first part of this report that the Ogarkov-Brezhnev conflict may be illuminated by supposing that the argument was conducted in two systems of accounting, paralleling the distinctions between CIA and DIA measures of Soviet military progress. The Party and government could have pointed to high rates of increase of military spending and of production by military machinery ministries based on the statistical reporting systems employed by the USSR Central Statistical Administration. These are measures that DIA has attempted to replicate. In contrast, the General Staff might well have complained about the real outcome of military spending on armaments, in terms of a lagging growth of production and procurement valued at constant prices of a base year. This is the kind of measure calculated by CIA.

This hypothesis may help explain why Moscow did not make known the retardation of its military spending and thereby try to undercut the buildup of American forces that began in 1977. **It was not in Brezhnev's domestic political interest to publicize the slowdown for, among other things, he would have strengthened the high command's hand in the debate on resource allocation.**

Although the retardation began around 1975, Ogarkov's open disagreements with his political superiors did not emerge until 1979 and intensified in the early 1980s. Various factors may have influenced this timing: perception of a heightened American threat, deterioration in Soviet economic performance, spillover of civilian production bottlenecks and shortages to the military sector, and major changes in the political leadership. **The open break in the summer of 1984** may have been occasioned by fear of Ogarkov's succeeding Ustinov in the post of Minister of Defense, but it **may also have been triggered by military demands for increased resources in connection with preparation of the military component of the 12th Five-Year Plan.** In addition, the initial years of decline in procurement of strategic systems coincided with the deployment transition between missile generations, but the persistence of the downturn, in the context of heightened Soviet-American tensions and the U.S.

strategic modernization, probably aroused misgivings in the high command.

The military's unhappiness may have centered on the growth of procurement, but perhaps they were also dissatisfied with the record of operations and maintenance (O&M) and research and development (R&D). The introduction of the operational maneuver group concept made great demands on training and operating outlays for higher states of readiness, which appear to have been met incompletely. There were also complaints about the adequacy of material expenditure norms and living standards of conscripts.

Ogarkov's warnings about the rapidity of technological change in nonnuclear weaponry may have implied discontent with the level of budget support for military R&D, but **he may have been more concerned with the process of weapons development and acquisition.** This may have appeared dangerously cumbersome in an era of accelerating military competition in level of technology. The high command may have been arguing for greater control over the Academy of Sciences, a larger share of scarce management resources, and much more rapid modernization of the military production base.

Gorbachev came into office intent on accelerating growth and modernizing the economy. **He therefore needed a stabilization of the external threat to be able to focus on his domestic program.** If that could not be secured through diplomacy, he would presumably feel compelled to respond with military measures, but these could compromise his domestic program. Gorbachev's military-economic dilemma did not begin in 1985 but developed over the previous decade. The nature of the options had not changed, but by the mid-1980s the tradeoffs had deteriorated.

Did the 12th Five-Year Plan, adopted in mid-1986, provide for a step-up in military spending? Only indirect evidence is available and it is inconclusive. However, **Gorbachev's speeches and statements as well as Moscow's actions** over the first two years of the new regime, including vigorous pursuit of arms control agreements with the United States, **strongly suggested that the military budget was still under constraint.**

The Soviet military's views on the Gorbachev domestic program cannot be totally unfavorable. They should certainly welcome the campaign against the corruption, lethargy, and alienation that have taken hold in Soviet society over several decades. On resource allocation, it seems reasonable to suppose that the military leaders recognize the future promise in the sharply accelerated investment in high-technology branches of machinebuilding. They may be prepared to trade off short term constraints on military production and

procurement for the future potential inherent in a technologically sophisticated military R&D and production base.

Civil-military relations appear to have taken a turn for the worse in 1987 as the armed forces and some of its leading personnel have come under unprecedented criticism. By the extension of "restructuring" to the military, highlighted by the removal of the minister of defense, the chief of air defense, and other high-ranking officers, **Gorbachev has demonstrated a considerable degree of power over the military.**

Greater control over the armed forces eases the political acuteness of Gorbachev's military-economic dilemma, but it does not resolve the dilemma. **The bargain between party and army, implicit or explicit, that accepts spending restraints now for the promise of a qualitative "leap forward" in the future is likely to hold only as long as the conditions of the understanding are fulfilled:** that the sacrifice of current security interests does not become unexpectedly large and the promise of future military potential appears realizable. If military procurement has to be cut back still further, and the ambitious targets for machinery output may be difficult to achieve without tapping the resources of military production, if Gorbachev is unable to limit the growth of American military power, if the Soviet modernization program lags badly, or if Western military technical progress accelerates, the modus vivendi may be undermined, as would Gorbachev's authority and possibly even his chances of political survival.

The military may also be uneasy over the erosion of the distinctiveness and priority of the military sector as well as over the prospects for speeding up military innovation. The first has been in process for a decade or more but appears to be accelerating under renewed pressures on military industry to share the burden of civilian development and because of the emphasis on dual use, high-technology machinery production. Development of that technology may contribute importantly to raising the qualitative level of military production, but it is unlikely to do much for the R&D process itself. Here Gorbachev's reform of enterprise incentives will be crucial, and so far little progress has been achieved.

If the Party and the army have achieved an understanding on military resource allocation, that understanding involves a continued acceptance of short term risks that in some military views have been mounting for close to a decade. **Gorbachev's maneuver space is not unlimited, and an inability to make good on his promises could rekindle the embers of Party-military conflict.**

CONTENTS

PREFACE	iii
SUMMARY	v
TABLES	xi
Section	
I. INTRODUCTION	1
II. OGARKOV'S COMPLAINT	4
CIA-DIA; Brezhnev-Ogarkov	4
Why was Brezhnev Silent?	12
The Timing of Ogarkov's Complaint	14
O&M and R&D as Subject for Complaint	18
Is the Procurement Slowdown Real?	22
III. GORBACHEV'S DILEMMA	24
Defense and the 12th FYP	25
Gorbachev's Views	27
Soviet Military Views on the Gorbachev Program	31
Signs of Revived Civil-Military Conflict	37
IV. CONCLUSIONS	39
Appendix	
A. SOVIET EXPORTS, PRODUCTION, AND PROCUREMENT OF ARMS IN THE 1970s AND 1980s	43
B. THE CIVIL-MILITARY DISTRIBUTION OF INVESTMENT IN MACHINEBUILDING	47
REFERENCES	49

TABLES

1.	Published CIA Information on the Growth of Soviet Military Outlays	5
A.1.	U.S. Government Estimates of Soviet Arms Transfers, Varying Periods	44
A.2.	Soviet Procurement, Production, and Export of Major Classes of Military Equipment, 1974-85 and 1981-85	45

I. INTRODUCTION

In the first half of the 1970s, many Americans—government officials, primarily, but also a few private sector analysts—argued that CIA was understating both the level and the rate of growth of Soviet military spending, hence also the size and perhaps the rate of change of the military share of Soviet aggregate output (burden of defense). In early 1976 CIA announced a significant revision of its estimates, doubling the level of military expenditure and the burden ratio as well as raising the calculated growth rate. Previously, the Agency had estimated a 3 percent average annual increase; after the revaluation of its accounts, the figure rose to 4–5 percent. This estimate was reaffirmed annually for the next six years.

In the meantime, the growth rate of the Soviet economy as a whole was diminishing rapidly, especially in 1979–82. The Agency estimated better than 5 percent average annual increases of GNP in the 1960s, dropping to 3.7 percent in the first half of the 1970s and to 2.7 percent in 1976–80; in 1979–82, total output increased in the aggregate by 6.4 percent for an average annual rate of 1.6 percent. This implied approximate stagnation of per capita output. Despite this extraordinary downturn, which brought with it scattered symptoms of political-economic crisis (for example, scarcity-inspired popular disturbances in several Soviet cities), the Soviet military buildup appeared to continue inexorably. The conjunction of these seemingly contradictory phenomena—sharply falling economic returns (with equally bleak prospects for the foreseeable future) and uninterrupted, sizable increases in military spending despite a heavy burden of defense on the economy—could be attributed to the open-ended demands posed by the Soviet security concept, the role of military considerations in the dominant political culture, and the institutionalized harmonization of Party and military interests (Becker, 1981).

However, in early 1983, seven years after the major upward reordering of its ruble accounts, CIA announced a downward revision of its estimate of the rate of growth of Soviet military outlays since the mid-1970s and through 1981 to almost 2 percent per year. The driving factor was a revised view of the trend in procurement, which was now seen to have exhibited little or no growth over this interval. This pattern was subsequently estimated to extend through 1984.

The explanation of the new pattern concentrated on three sets of factors—difficulties in development and production of advanced

military systems, the effects of shortages and bottlenecks in the general economy spilling over to military production, and deliberate policy decisions for one or another motivation (Kaufman, 1985; Becker, 1985). Initially, CIA and DIA leaned to the first two categories of explanation, but CIA at least has moved over to emphasizing the likelihood of a policy shift.

A recent RAND study (Azrael, 1987) explores the conflict between the Soviet high command, led by the former chief of the General Staff Marshal Ogarkov, and the Party leadership in the late 1970s and early 1980s. This study contends that among the central themes of the many-sided Party-military conflict was a dispute over the adequacy of resources allocated to the military sector, the Party insisting that the military had as much as it needed, and the military demanding more.

If this reading of the evidence is correct, and the case seems persuasive,¹ the conflict raises several questions. First, are the phenomena outlined here related? Was the Soviet military protesting a constraint on its budget, and in roughly the magnitude and pattern estimated by the U.S. government? Second, if so, had the Party then decided on a slowdown in military spending against the wishes of the high command? Alternatively, was the Party refusing additional resources to rectify a downturn that had developed for reasons other than a policy decision? Or was the conflict over some combination of these alternatives? Third, why did the budgetary dispute appear to erupt only in 1979-82 rather than in the mid-1970s when the slowdown began? Is this explained simply by the surfacing of a conflict that had previously smoldered invisible to the Western eye, or was the timing related to the causes of the slowdown?

As noted, CIA believes the slowdown has stretched at least through 1984. With the succession of Gorbachev and the adoption of the 12th Five Year Plan (FYP), the issue of the adequacy of the Soviet military budget was raised anew. Moscow sounded deeply disturbed about the American military buildup, particularly about the multiple threats of a sustained SDI program. To step up military spending sharply, as might be called for by the prolonged retardation and the rhetoric of the American danger, could jeopardize the civilian program of economic modernization and acceleration that is the centerpiece of Gorbachev's campaign to reconstruct Soviet society. But to maintain a tight rein on military spending could risk falling (further?) behind in the military competition.

Thus, the issue of adequacy of resource allocation raised by the Party-military conflict, in which Ogarkov was the principal military

¹See also Spring, 1986a, 1986b, and 1987; Strode, 1984 and 1986.

voice, was not resolved by his removal as chief of the General Staff in September 1984. The issue remains, although in a different guise. Gorbachev's dilemma is directly connected to Ogarkov's complaint.

This report attempts to shed some light on the two elements separately as well as on their connection. More than is usually the case with analysis of Soviet policy, the report cannot offer definitive answers. Indeed, the author must frankly acknowledge that Sec. II offers a speculation—a plausible one, it is to be hoped, based on some foundation of evidence, but a speculation nonetheless. The author also hopes that this report will stimulate further research into the complex relationships between military economics and domestic politics over the past decade, perhaps shedding additional light on the issues discussed here.

II. OGARKOV'S COMPLAINT

Assuming that one of the chief bones of contention between the Party and military leaderships in the late 1970s and 1980s was the size of the defense resource allocation, what was the argument about? The military leadership appeared to be complaining of inadequate resources and the political authorities were asserting the contrary. But was this an argument about the aggregate defense budget or some of its components? Did it relate to absolute levels or growth rates? Values in current or in constant prices? Values or physical units?

CIA-DIA; BREZHNEV-OGARKOV

Soviet sources contain little to resolve these questions, so we must have recourse to Western estimates and ponder them for clues to the substance of the Soviet polemic. We first summarize CIA estimates for the period since 1965, the first year of the Brezhnev-Kosygin regime. Unfortunately, these too are being reported more sketchily than in the past. CIA has not published an unclassified report on Soviet ruble expenditures on defense since 1978 and the last paper on dollar outlays appeared in January 1981. The information in the annual testimony before the Proxmire subcommittee of the Joint Economic Committee is fragmentary. Table 1 assembles the few indications provided during CIA's participation in the March 19, 1986 session (Allocation 1985).¹

Table 1 is roughly consistent with the information that has been released over the past three or four years, primarily in testimony before the Joint Economic Committee (Allocation 1983 and 1984). Soviet ruble defense expenditure grew at about 4 percent per year in the first Brezhnev decade and then slowed to a pace half as great. The change is due to a sharp reduction in the *growth* of procurement that (virtually?) ceased after 1974 or 1975. Total expenditure has continued to grow at 2 percent largely because of the continued buoyancy of R&D, increasing at a rate of 5 percent or better.² Some of the ruble growth

¹At this writing, the proceedings of the March 19, 1987 session are not yet available. The joint CIA-DIA paper presented at that session has something to say on defense outlays in 1985-1986 and in the future. It will be considered in Sec. III below.

²R&D appears to account for about a fifth of total military spending (Allocation 1985, pp. 31, 7, 109). According to the last published CIA report on ruble defense spending (CIA, 1978a), procurement and construction took half of the total. That proportion should have diminished as procurement growth was frozen. Thus, if procurement was increasing at 1 percent or below and R&D at 5 percent or better, the sum of the other

rates would appear a bit higher in 1970 prices, the weights previously used by CIA; this relationship between magnitudes at the two sets of prices is what one would expect from economic index number theory.

Row 2 in Table 1 shows that Soviet military outlays at current prices are estimated to have increased more than 5 percent annually since 1970. This is a new indicator for CIA; its measures of change in Soviet defense expenditure are almost always expressed in terms of constant-price values, either ruble or dollar. However, the appearance of this indicator is not due to a change in methodology; it emerges from the procedure for changing weights to 1982 prices. Unless CIA develops a new methodology of estimating current-price values (or is

Table 1
PUBLISHED CIA INFORMATION ON THE GROWTH OF
SOVIET MILITARY OUTLAYS
(Average annual rate of growth in percent)

Outlay Component	Prices	Time Periods			
		1966-75	1966-84	1971-84	1975-84
(1)	(2)	(3)	(4)	(5)	(6)
Total	1. 1982 rubles	about 4	almost 3	roughly 2	
	2. Current rubles			>5	
	3. 1984 dollars	about 4			about 2 ^a
	4. 1984 dollars ^b	3½	>2½	2	<2
Procurement	5. 1982 rubles	about 5 ^c			
	6. 1984 dollars				about 1
R&D	7. 1982 rubles ^b	over 5	about 5	about 5	about 5½
	8. 1984 dollars ^b	over 5		almost 5	almost 5

SOURCES: Allocation 1985: Row 1: col. 3—p. 31 (the 19 year increase is stated as “nearly 50 percent”); col. 4—p. 68; col. 5—see Row 2. Row 2: p. 66 (price changes accounted for “more than half” the “over 5” percent annual rate in current prices). Row 3: p. 33 (the rate in 1974-1985 was “about half the rate of the previous period”). Row 4: p. 156. Row 5: p. 161. Row 6: pp. 7, 36, 101. Row 7: p. 109. Row 8: p. 108.

^a1974-1985.

^bCalculated from absolute values read from a graph.

^c1966-74.

components—operations and maintenance, personnel, and construction—could not have grown faster than 1½ to 2 percent to keep within the aggregate spending rate of change of 2 percent.

endowed with an abundant flow of price information), current-price growth rates for the last half of the 1980s will have to wait for the next transfer to a new price base.

In any case, the appearance of this measure provides a unique opportunity for comparison with DIA ruble calculations, whose methodology has nothing to do with building blocks but involves manipulation of Soviet economic statistics. DIA and CIA agree (Allocation 1985, pp. 16, 31) that since 1970 "the pace of Soviet military spending has grown faster than the economy as a whole" (both measured in current prices). However, although the two agencies in their joint submission put forward the figure of "over 5" percent as the annual rate of increase of defense spending in 1971-84 (p. 66), DIA's subsequent and separate submission uses the figure "about 7" for the rate of change since 1970 (p. 111).³

The issue is not one of interagency disagreements or even methodological niceties. The differences between the DIA and CIA measures, in both concept and size, raise the more important question of the perceptions of Soviet leaders with regard to changes in their military budget. Did the Soviet Defense Council discuss the issue of "how much is enough" in terms of measures at constant prices or at current prices? If the U.S. government calculations are reasonably accurate and also akin to the indicators used in Moscow, Soviet leaders would have seen a low rate of growth in constant prices but a markedly higher one in current prices. Similarly, current-price calculations would show the burden of defense rising from about one-sixth or one-fifth of net material product (NMP), the aggregate output measure used in the USSR, in 1970 to around 22 percent a decade later.⁴

³The figure DIA reported in 1983 is 7 percent (Allocation 1983, p. 189); in 1985 this became 6-7 percent (Allocation 1984, p. 171).

There are minor anomalies in CIA's position as reported in Allocation 1985. CIA and DIA agree on the rate of change of GNP in current prices—about 5 percent (pp. 64, 111) but this throws a bit of doubt on CIA's agreement that defense outpaced GNP (cf. pp. 64 and 86). Another small difficulty is that GNP growth at 1982 prices in 1971-84 was about 2.6 percent (pp. 65 and 80), which seems tangibly higher than the approximate 2 percent real increase for defense shown in Table 1; yet the defense/GNP ratio in 1982 prices is said to show "essentially no change" in this period (p. 112).

⁴Military expenditure in 1970 from Measures, 1982, p. 123, and Allocation 1983, p. 94; NMP from Narkhoz 1982, p. 378; military expenditure in 1982 from Allocation 1985, pp. 31 and 77. Note, however, that calculating military spending in 1982 from a GNP figure and the indication of 15-17 percent defense-to-GNP share implies 7 percent growth per year over the 1970 figure shown in Measures, 1982, whereas CIA explicitly states "over 5". The 1970 figure may have been revised after the 1982 publication.

The Soviets may calculate a defense burden ratio with "utilized national income" in the denominator instead of NMP or "produced national income." The former is smaller than the latter by a percentage point or two; the difference arises from the subtraction of "losses" and the foreign trade balance.

Valuation at constant prices would indicate a declining burden; the Soviets claim a growth rate for NMP of about 4.8 percent per year in 1971-82, compared with the CIA estimate for military outlays of about 2 percent.⁵ Was this the basis of the polemic between Ogarkov (backed, presumably, by much of the military establishment) and Brezhnev? Was Ogarkov pointing to flat "real" procurement and Brezhnev to the high rate of increase in total outlays? Did the high command suggest that the real burden remained constant or even declined, and did the Party leadership maintain that it was rising?

To put the issue in this form forces the question of the measures actually used by the defense policymakers. Undoubtedly, they would review data in physical units: manpower available, recruited, and deployed; production and procurement of military systems; East-West order of battle arrays; and the like. It seems reasonable to suppose that high level briefing papers on defense also cite expenditure in current prices. The alleged value of budget outlays on "defense" in current prices is published each year and discounted almost completely in the West (probably in the USSR as well), but a truer total is probably compiled regularly (although never published) and disseminated internally in an extremely restricted circle. One would guess that this total is also broken down by some classification of resource elements (personnel, operations, construction, etc.) and perhaps even by service. A constant price counterpart to the announced defense budget is not published either: Once or twice numbers have appeared to represent the value of defense at constant prices, but they turn out in fact to be the usual budget figures (e.g., Narkhoz 1974, p. 576). There seems to be no bar in principle against such a series, but neither the Ministry of Finance, which collects and processes fiscal data, nor the Central Statistical Administration (TsSU) has ever published values of other budget components at constant prices.

The conflict may also have been maintained by different views of the rate of military production derived from different statistical reporting systems. The government's regular system of collecting and processing data on the operation of the economy, headed by TsSU, produces standardized reporting on the value of industrial production. Military production undoubtedly is treated with special security precautions, but the statistical series and the methodology of compiling them are surely the same as for civilian production.⁶ TsSU compiles

⁵With GNP as the denominator, the burden ratio would appear relatively constant, since the growth rate of GNP is about 2.6 percent (Allocation 1985, p. 77).

⁶The intermingling of civil and military output in the same plant, the fact of considerable military use of apparently civil output (motors, trucks, etc.), and the fuzziness of the distinction between military and civil output in some categories (e.g., some types of communication gear) must militate against any separate statistical accounting system.

output data in physical units for defined nomenclatures of important products, but it also calculates value of output in current and in "comparable" prices. DIA has for several years attempted to replicate the value of gross output at "comparable prices" of the nine machinebuilding ministries controlled by the Military Industrial Commission (VPK),⁷ calculated as the difference between the output of all 20 machinebuilding ministries and the 11 nonmilitary ministries.

TsSU also publishes data on the value of gross output of machinebuilding and metalworking, generally in index form based on "comparable prices." These data are from a second type of output classification, by branch of industry.⁸ Attempts have been made in the West to estimate the final military machinery component of this series by another residual accounting, subtracting all known consumer and producer uses as well as all intermediate product. Because of the large uncertainties in the Soviet data, the reliability of these estimates is in doubt (Becker, 1979, pp. 362-363; Bond and Levine, 1983). DIA regards its estimates of the output of military machinery ministries as much more credible than the estimates of the final output of (branch) military machinery and considers the change over several years in the ministry series as a reasonable proxy for growth of all military production.⁹ In DIA's esti-

⁷Aviation Industry, Communication Equipment, Defense Industry, Electronics, General Machinebuilding, Machinebuilding, Medium Machinebuilding, Radio Industry, and Shipbuilding Industry.

⁸Soviet production data may be compiled and reported in three different distributions—by ministry, branch, and commodity classifications. Thus, the value of machinebuilding (MB) output in a ministerial classification will include any and all output of the 20 MB ministries and will exclude the MB of non-MB ministries; in the branch classification, MB produced by enterprises whose major production is MB (whether or not they are administered by a MB ministry) will be counted, but so will all other output of these enterprises, and the MB production of non-MB enterprises (including those in MB ministries) will be excluded; only the commodity classification provides a count of all MB and only MB output, no matter where produced. (Commodity value counts are generally associated with input-output tables and are therefore likely to be compiled only intermittently.) This characteristic of Soviet statistics has confused many Western attempts at reconstructing Soviet production accounts (particularly the efforts to derive residual values of Soviet hardware production). It would not be surprising if it also confused Soviet internal discussions about the progress of military production.

⁹It has long been known that the military machinery ministries also produce civilian output, producer and consumer durables and other goods. Research by Julian Cooper (1986a) indicates that the share of civilian output is quite large. DIA's confidence in its estimates as a proxy must therefore be based on confidence that the civilian share of military ministry output has not been rising substantially. No confirming evidence is supplied, but that implicit claim may be plausible. Let a = the civilian machinery production in military machinery ministries, b = total output of military machinery ministries, and c = all output of civilian machinery. Cooper (1986a, p. 40) suggests that a/c was roughly stable in the 1970s. If b grew more rapidly than c , then a/b was declining.

mate, this output bundle grew at average annual rates of about 13 percent in 1966-75 (DIA, 1982, p. 4) and about 8 percent in 1976-82.¹⁰

Western analysts have generally discounted Soviet value series in "comparable" prices on the grounds that these are not true constant-price weights. The overwhelming majority view is that especially in machinebuilding and metalworking, as well as in a few other branches characterized by fairly rapid change in product-mix, the incentive structure of enterprise operation and TsSU practice result in the incorporation of considerable price inflation in these series. The rules of the game of "comparable" pricing allow for inflation of output on account of higher initial prices of new products (many of which are new in name only) that are incorporated into the series after the base year.¹¹ Thus, TsSU calculations of the value of military output, in the ministerial or branch classifications, would probably show markedly greater increases over time than a Western-estimated series, even with the same raw data. Ignoring the element of Soviet net exports, which is discussed below, if the value of military production may be taken as a proxy for procurement, TsSU statistics probably showed a positive rate of growth, perhaps one approximating the DIA estimate.

The military also has some sense of arms transaction values: After all, the MOD (Ministry of Defense) buys a variety of goods and services from economic enterprises inside and outside the MOD. What it may not have is the apparatus for developing values of output in "comparable" prices of a base year, for this is a reporting relationship between producing enterprises and the TsSU. The MOD will surely know, however, the numbers of weapons, munitions, machines, equipment, components, materials, etc. it procures. The deputy minister of defense for armaments will therefore be able to keep his minister and the General Staff fully apprised of changes in the numbers of major and minor weapon systems, as well as of other categories of materiel, procured in each reporting period. Moreover, the MOD also knows the prices it pays for these goods, and it is therefore not difficult to imagine the ministry or the General Staff ordering up a study of the changes in the aggregate value of procurement using procurement prices of some base year as weights.¹² If CIA is approximately right, the

¹⁰Implied by the growth rate for 1966-75 and a reported 11 percent for 1971-82 (Allocation 1983, p. 7). See also DIA, 1985, p. 2.

¹¹There is a very considerable literature on this subject. To cite only a few works, see Becker, 1974; Berliner, 1976, Sec. 10.1; Steiner, 1978; Hanson, 1984.

¹²Vladimir Trembl (personal communication) has suggested that it would be cumbersome and expensive to develop a military procurement or production bill by weighting a time series of thousands of items measured in physical units with a set of prices. Moreover, some information for such a calculation may be available only in value terms (for example, ammunition, explosives, spare parts, etc.). This suggests that if the General

procurement value series would grow (if at all) much more slowly than TsSU's value of output.

Assume, then, that military expenditure and defense production in current and "comparable" price valuations were in fact rising at rates perhaps as high as 5-8 percent per year, while procurement at true constant prices was growing very slowly if at all. To reconcile these statistics it is necessary to determine the trend in arms exports. That is, if we assume an inflation rate of 3 percent per year,¹³ giving procurement very roughly that *nominal* rate of increase, is the difference between 3-4 percent procurement and 5-8 percent production increase accounted for by accelerated exports? And if so, was that a basis for high command discontent?

The open-source data on Soviet arms exports are, unfortunately, sparse and difficult to evaluate. The evidence is assembled and analyzed in App. A. The discussion there is inconclusive with respect to the value of arms exports, but it is evident that the U.S. intelligence community estimates decline in both production and procurement of major weapons systems—fighter aircraft, tanks, intercontinental missiles, submarines, artillery and major surface combatants (at least in production in the latter two categories).¹⁴

Even if arms exports were growing and more rapidly than procurement, there is no evidence that the high command was distressed by that development (except insofar as the recipients misused the arms). The Soviet military may well have considered this a contribution to the enhancement of the Soviet global power position. Also, the

Staff did seek an alternative view of the real growth of procurement or production, it might have been content to measure the change for major systems alone, omitting the minor elements that make such a calculation particularly difficult. Alternatively, the General Staff could have attempted to deflate current-price values by developing its own price index. That would have been a considerably more difficult task and therefore seems even less likely in this already speculative structure.

¹³See Table 1, sources to row 2.

¹⁴The reduction in number of units of major systems produced had much to do with the increasing cost per unit, a phenomenon quite familiar in Western military development. For example, CIA (1986b, p. 5) estimates the dollar cost of the Fulcrum (MiG-29), an aircraft of the early 1980s, as almost three times that of the Fishbed C/E (MiG-21) whose Initial Operating Capability date is 1961; the SS-18 Mod 4 is estimated to cost almost four times as much as the SS-7. The cost ratios of these systems in rubles are undoubtedly different, but the fact of cost escalation is indisputable. A substantial fraction of these large cost increases reflects pure price inflation, the result of wage and salary creep outpacing productivity growth as well as of other sources of price increase in both the civil and military sectors of the economy. In addition, however, substantial increases in capability were being purchased with the extra cost. Because of cost escalation but also contributing to it, the Soviets began to develop multi-mission systems, in contrast to their previous style of specializing weapon models for particular missions. Thus, the decline in number of units produced was at least partly a matter of military policy, or at least of adjustment to the realities of economic life.

composition of exports and procurement differs substantially: Soviet arms transfers over the past decade have included modern and sophisticated equipment, especially to the Middle East and South Asia, but in general the most advanced systems are taken up in domestic procurement considerably before any dispatch abroad.¹⁵ Nuclear warheads and bombs have never been exported. Nevertheless, although Soviet military leaders may have been interested in sustaining the pace of arms transfer and may also have expected some decline in the number of units procured, they could still have been dissatisfied with the rate of growth of production, which constrained the desired rate of procurement.

At first glance, it seems surprising that the Soviet General Staff would have worried about the adequacy of Soviet procurement levels sufficiently for the chief to have risked an almost open clash with his Party superiors. Measured by quantities procured relative to what was coming down the American pipeline, it would be hard to make a case for Soviet alarm. In the decade 1974-85, in the last half of which American procurement levels were rising very rapidly, the Soviet military acquired 50 times as many bombers (long and intermediate range); ten times as many artillery pieces; nine times as many SAMS; more than three times as many tanks, helicopters, and strategic ballistic missiles; 2½ times as many submarines; and twice as many fighter aircraft as did their American counterparts (Allocation 1985, p. 13). As we know, however, the General Staff had never been comfortable with merely matching its main adversary in numbers of major systems for various reasons, including its concern over the military potential of both European NATO and its Far Eastern neighbors. Also, the General Staff may have at least partly shared the opinion of the U.S. Under Secretary of Defense for Research and Engineering that the USSR was ahead of the United States in none of the 20 most important areas of military technology, tied in only six, and lagging behind in the other 14 (Allocation 1985, pp. 115-116).

Thus, it is entirely plausible that the Soviet General Staff, unhappy with the declining production trend and rising cost of some major systems as well as the technological gains of their major adversary, might have commissioned a study of the "real" change in the value of procurement. As already suggested, such a study could have derived another set of price weights to replace the "comparable prices" employed by the TsSU, which would have produced a rate of uninflated change similar to that estimated by the U.S. intelligence community.

¹⁵Entire production lines and runs are often dedicated to export variants (CIA, 1986b, p. 8)

Armed with such evidence, the high command could have claimed that the real value of what was coming out of the production pipeline had grown little if at all since the mid-1970s and demanded more resources to speed up the process. It is equally easy to imagine that the government and Party leadership rebuffed this effort to undermine their monopoly of economic information, insisting that the military should instead pull up its socks and improve its efficiency.

WHY WAS BREZHNEV SILENT?

This line of reasoning may also help explain the puzzle of Soviet silence on the slowdown of defense spending. According to the U.S. intelligence community, the real growth rate of Soviet military outlays was cut in half in the mid-1970s and that of procurement was slashed more sharply, from about 5 percent per year to perhaps 1 percent. That realization came fairly late relative to the inception of the slowdown. It was only in 1983 that CIA announced its revision, and it took a while to harmonize the divergent views of CIA and DIA. Until that time, the American public was still under the impression that Moscow was continuing to build up and modernize its forces at annual rates of 4-5 percent despite the severe downturn in Soviet economic fortunes.

There was, of course, other evidence of Soviet intentions that entered American policy calculations: Soviet activity in the Third World in particular. Washington laid great stress on the nature of Soviet purposes revealed by Moscow's involvement in Sub-Saharan Africa, the Middle East, and Southeast Asia; the invasion of Afghanistan produced extensive shock waves in the West, especially in the United States. Still, one of the important influences responsible for reversing the real decline in the value of the American military budget and for mustering support for an accelerated rebuilding of U.S. military forces in 1977-1982, the last years of the Carter administration and the first two of his successor, was the belief that the Soviet military buildup was still proceeding rapidly at a rate unchanged since about 1960.

It is conceivable that had the American public been aware earlier of the "true" growth pattern of Soviet military outlays, as revised by CIA in 1983, Congress would have been much more reluctant to vote substantial increases in U.S. defense appropriations. Surely the Soviet leadership must have been aware of this linkage in the American political process; they certainly criticized the American threat perception often enough, and in their critiques accused the Pentagon of falsifying the threat in order to increase the U.S. defense budget. Why then did

the Kremlin not attempt to publicize the fact of the slowdown in Soviet military spending so as to affect the U.S. budgetary process?

Moscow was in fact claiming a decline in military spending, not just in the rate of growth but in the absolute level. The officially claimed budget outlay on "defense" had increased in the late 1960s, but in the 1970s the "defense" outlay was 17.9 billion rubles in each of the years 1970-73 and then it declined slowly to 17.1 billions annually in 1980-1983. It was on this basis that Marshal Ustinov (1977, p. 16) could argue that Soviet defense spending was shrinking, in contrast to the rising trend in NATO. That claim was totally discounted in the West precisely because it appeared to refer to the official "defense" series: It had become common knowledge that these figures substantially understated the true level of total Soviet military outlays.

It might be argued that if the Kremlin wished to make known the retardation of its military budget, it would first have had to release the true total. Such a revelation would have been extremely awkward politically, and therefore to continue the argument, the Politburo's hands were tied;¹⁶ it depended on CIA to arrive at the truth unaided. Of course, by insisting on the validity of the official "defense" figure, Moscow hindered its own cause, if that is what it was. Had Soviet leaders been willing to pass the word in various informal channels on specifics—changes in rates of production and procurement of particular systems—the change in U.S. perceptions might have come earlier. But that was not done either.

The argument developed here on the statistical dimension of the Ogarkov-Brezhnev conflict suggests another explanation that probably cannot stand on its own but may have reinforced the general unwillingness of the Politburo to lift the lid on its military budget. It was not in Brezhnev's domestic political interest to publicize the slowdown, for he would have immensely strengthened the high command's hand in the debate on resource allocation. To the Soviet public he was proclaiming that, in a period of rising tension and growing U.S. power, the Soviet military was getting everything it needed. That contention would have been difficult to sustain if the truth looked like the CIA version and it were revealed to the Soviet people. Brezhnev would also have opened himself to the grave charge of weak response to external challenge and of attempting to appease the class enemy. These seem like powerful reasons for Brezhnev to have maintained traditional silence on the true size and growth of the defense budget.

¹⁶Perhaps the Politburo was also unwilling to verify the accuracy of U.S. intelligence estimates. Moreover, the Kremlin was pushing for increased defense budgets in Eastern Europe (see, for example, Moore, 1978) and could hardly sustain that pressure while admitting to an easing of its own military effort.

THE TIMING OF OGARKOV'S COMPLAINT

Ogarkov's divergences from official policy began in 1979 and intensified in 1981-82. Until then there were only hints of dissatisfaction in the Soviet media but few overt expressions of opposition.¹⁷ Ogarkov's open disagreements with his political superiors appear to have reached the breaking point in the spring and summer of 1984; he was removed from his post as chief of the General Staff in September of that year. Ogarkov's increasing concern, which impelled him on the risky course of public dissent, may have been generated by several external and internal factors.

Externally, the paramount influence clearly was the Soviet perception of a sharply heightened threat from the United States under the leadership of Ronald Reagan. Ogarkov had long been in the lead of a military lobby pressing the importance of nonnuclear high technology. The American buildup was seen as moving rapidly in this direction in addition to the strong component of nuclear modernization. Internally, the years 1979-82 saw a rapid deterioration in Soviet economic performance. Even by Soviet count, industrial production growth rates declined from 5-6 percent to about 3 to 3½ percent (Narkhoz 1980, p. 122; Narkhoz 1985, p. 92); CIA estimates the average annual rate for 1979-82 as below 2 percent (CIA, 1984, p. 69; CIA, 1985a, p. 69; CIA, 1986a, p. 71). Agricultural output was stagnating or falling and per capita consumption barely rose if at all. The Party leadership seemed too decrepit or too engrossed in obtaining a share of the spoils to care

¹⁷Strode (1984) cites Dolgikh's argument in early 1977 against cutting back on machinebuilding to benefit consumption and Ustinov's comparison at about that time of the rising trend in NATO defense outlays and the allegedly falling level of Soviet outlays. One of the most pointed, if still indirect, comments came in January 1976 from Colonel General N. Alekseyev, then deputy minister of defense for armaments (I am grateful to RAND colleague Larry Caldwell for drawing my attention to this article):

[Soviet servicemen and the entire Soviet people] cannot fail to take into account also the fact that despite the process of the relaxation of international tension taking place under the influence of the peace-loving policy of the USSR and the other countries of the socialist community, *reactionary imperialist circles have not abandoned their aggressive designs and are continuing the material preparations of a new war and stubbornly hindering the supplementing of political detente with military detente* [italics added].

This was said after seven years of real decline in the U.S. military budget, the American defeat and withdrawal from Vietnam, the signing of the Helsinki final act, and on the eve of the 25th Party Congress, where Brezhnev reaffirmed his basic detentist stand.

Later in the article Alekseyev declares that "our armed forces are constantly being provided with the most modern types of weapons and combat equipment," and his final judgment is that "the Soviet armed forces now have all combat facilities for fulfilling worthily the tasks set them by the party." Evidently, Alekseyev had no intention of doing battle with his political superiors on the adequacy of the defense budget, but he did see fit to raise a warning flag.

about the deterioration. Public morale was plummeting. Only corruption, drunkenness, drug abuse, and crime were clearly on the rise.¹⁸

Whether Ogarkov perceived these developments in quite the same way is unknown, but he could not have been ignorant of the main lines. He would certainly have been aware of and irritated by the spillover of bottlenecks and shortages in the civilian economy to military development and production. The eroding psychological environment may have contaminated military industry directly and made its own contribution to the sluggishness of output growth there.

Perhaps there were various political factors at work, too. Ogarkov's interventions may have taken account of the changes in top leadership at the time: Brezhnev's deteriorating health, the death of Kosygin in late 1980, Suslov's death in January 1982, Brezhnev's death in November 1982, etc. Perhaps he became alarmed at evidence of a movement to undercut the General Staff and rumors of Andropov's interest in civilianizing the staff of the Defense Council.

Another possible issue of timing, however, should also be noted. The breaking point of Ogarkov's feud with the political leadership arrived in the late summer of 1984. By then it may already have been clear that Ustinov was gravely ill, and perhaps the fear that Ogarkov would succeed to the post of Minister of Defense was sufficient to galvanize a consensus in the Politburo to remove him (Azrael, 1987, p. 35; Herspring, 1987, p. 54). It may also be relevant, however, that roughly at this time the General Staff and Ministry of Defense were probably preparing their requirements for the 12th FYP, the draft military development plan. It is more than possible that Ogarkov was pushing hard for a considerable increase of resources for the military sector in 1986-90 relative to what had been allowed in the 11th Plan period.

Several commentators have pointed to the evidence of military dissatisfaction with resource allocation in general or on specific issues (Azrael, 1987; Herspring, 1987; Strode, 1986). By 1983-84, the Soviet military had experienced almost a decade of considerably reduced real growth of military goods and services while they had witnessed a rapid recovery in the military spending of their chief adversary.¹⁹ True, the Soviet economy was in the doldrums; but this was less likely to induce the military leadership to call for cutting back the military budget than

¹⁸This was the picture conveyed by several contemporary Western accounts. See, for example, Feifer, 1981. Now it is being confirmed by the highest Soviet authority. See the indictment at the beginning of Gorbachev's speech to the Central Committee Plenum, *Pravda*, January 28, 1987.

¹⁹Vladimir Treml (personal communication) noted that the allocation to "science" from the state budget, which may cover mainly military R&D, increased only 3.8 percent in 1984 after fairly steady growth since 1977 at an average annual rate of 7.4 percent (annual editions of *Narkhoz*).

to enlist its support for bolder economic direction.²⁰ Ogarkov, in fact, was pushing for "a system of centralized control of the country and the armed forces" (Herspring, 1987, p. 45; Azrael 1987, pp. 11-12), thus, apparently, for a much stronger military involvement in political and economic policymaking and direction. Possibly, he saw the country's situation at the time as enhancing the chances for a fundamental reorganization along such lines.

Considering the power of his intellect and personality, the possible scale of his demands and the weakness of the political leadership, the prospect of Ogarkov as Minister of Defense, member of the Defense Council, and member of the Politburo might well have emboldened the Chernenko Politburo sufficiently to remove him. But it is possible that an additional trigger was the schedule of the defense planning process, which brought the discussion about military resource allocation to a head in mid-1984.

There is a curious postscript to this issue. On March 2, 1984, Chernenko pointedly remarked that the Soviet leadership had not even considered cutting social programs to step up defense spending despite the "complexities of international life." On April 29, he rejected suggestions made in letters to the Central Committee to lengthen the work week and establish a fund for national defense, on the grounds that increases in defense efficiency had made this unnecessary. In May Ogarkov demanded in the pages of *Krasnaia zvezda* the "unconditional fulfillment" of the political leadership's pledge to make "constant, all-around efforts to safeguard the country's security and insure the reliable defense of the Soviet people's peaceful labor" (cited by Azrael, 1987, p. 34).²¹ In September, he was removed. And on November 27 the USSR Supreme Soviet "voted" a 12 percent increase in the explicit allocation to "defense."

The West has long refused any credence to this figure as the sum of Soviet military outlays. Nor is there any accepted explanation of what the figure does represent, especially in view of its peculiar pattern in the last 15 years (it declined without interruption between 1973 and 1980 and remained at the 1980 level through 1984). Hence, the abrupt increase in 1985 may be no more meaningful of change in actual outlays than the steady decline in the 1970s. It is sometimes suggested that the latter pattern may have been intended to signal Soviet commitment to detente. If so, the December 1984 increase was presumably

²⁰Weickhardt, 1986, argues that the military has supported economic reform. His case, based on materials in the Party-military press, is not compelling, but the argument seems plausible nevertheless.

²¹Azrael contends Ogarkov was more conciliatory of his superiors than this passage suggests.

also a political signal, perhaps a warning to the West not to interpret Ogarkov's sidelining as an indication of weak resolve to meet the Western security challenge. Did military expenditure in fact accelerate in 1985? The U.S. intelligence community estimates a slight increase in the growth rate, perhaps 1 or 2 percent (CIA-DIA, 1987), nothing like the official claim.

One other factor of timing should be added to the list. Shevchenko (1985, p. 204) tells us that the high command agreed to SALT I primarily

to achieve by negotiation what the Soviets feared they could not attain through competition: a restraint on America's ability to translate its economic and technological strength into military advantage and a breathing space during which the USSR would work to narrow the gap.

If this was the bargain made with the Politburo, the main quid pro quo for military backing of SALT was vigorous military R&D. Is there also an implication for the growth of procurement? If a restraint was actually imposed on American weapons development or acquisition, the need for high and rapidly growing procurement was to some extent obviated. Of course, SALT dealt only with strategic nuclear weapons and the competition in conventional weapons could still proceed. For Ogarkov in the late 1970s and early 1980s, this apparently became the principal concern. Even in strategic nuclear weaponry, however, current procurement was far from irrelevant. The military had not pledged themselves to freeze the qualitative level of the strategic forces. Indeed, the Soviet negotiators had made strenuous efforts to allow room in the SALT treaties for force modernization. Shortly after signing the treaties, the Soviets tested, produced, and gradually deployed their fourth generation ICBMs. In addition, advancement of the technological level of weaponry cannot be restricted to R&D, it depends on the learning obtained from deployment and operation in the field to feed back into further development. The military would therefore have hardly consented to trade off robust R&D growth against sharp cut-backs in procurement.

Nevertheless, procurement by the Strategic Rocket Forces and Air Defense Forces probably did fall. At least the sum of operating and investment outlays by these services is reported to have declined by more than 5 percent per year after 1977 and probably through 1982 (Allocation 1984, p. 246). If this is correct, their procurement outlays probably fell at least as sharply if not more so. The decline in procurement may have been associated initially with the completion of the deployment of the fourth generation ICBMs; but normally deployment

is a cycle, and procurement would be expected to reach a trough and then pick up again. The length of the cycle period, however, is surely not a constant and must depend, among other factors, on the changing complexity of the technology embodied in each generation.

That factor may explain in part why military complaints were voiced publicly in the early 1980s. If the first years of decline in procurement of strategic systems coincided with the completion of the introduction of one generation and the latter stages of development and testing of the follow-ons, this would have been expected. But the persistence of the decline, in the context of the deterioration of Soviet-American relations and the U.S. strategic modernization program, probably aroused strong misgivings in the high command.

O&M AND R&D AS SUBJECT FOR COMPLAINT

The political leadership may have been reasonably satisfied with the volume of resources allocated to the military, or perhaps it was convinced that economic stringencies made it imperative to maintain a tight rein on military spending. Evidently, the military high command was not persuaded. But of what, more precisely, were the military complaining?

Up to this point, it has been assumed that the main issue was the adequacy of the level or rates of growth of procurement, whose virtually flat curve in the CIA estimate drives the overall decline in the rate of increase of military outlays. There is some fragmentary evidence on two other resource components of military outlays, operations and maintenance (O&M) and R&D.

Developments in Soviet military doctrine and organization posed increased requirements for O&M outlays that may have been far from completely satisfied. The principal change in this regard is the development of the operational maneuver group, a concept of deploying second echelon forces much closer to the front and employing them early in the breakthrough. Odom (1985, p. 9) characterizes the concept as putting "even greater stress on command and control, synchronization of movements, fire support, air support and logistics." It is part of Ogarkov's larger concept of the "theater strategic operation," which "places even greater demands on the Soviet officer corps, demands that probably exceed its already impressive education and training achievements in the postwar decades." The new doctrinal concepts, therefore, seem to call for considerably more intensive training and for correspondingly high operating expenditure of fuels, lubricants, ammunition, and other stores. However, only 40 percent of Soviet forces are "ready"

units; "Warsaw Pact aircrews usually fly at only about half the annual rate of U.S.-active duty aircrews" (DOD, 1986, p. 98).²² The Soviet Navy also operates at much lower levels of intensity than does its American counterpart. There have been complaints about the inadequacy of the training resource base, excessive tightening of material expenditure norms, and low living standards of Soviet troops. Apparently Ustinov led a fight to devote more resources to troop housing, food and medical care (Strode, 1984, pp. 40-44, 52-53, 60; 1986, pp. 63-66).

In CIA's estimates, military R&D is the most rapidly growing component of military expenditure, increasing, in real terms, at about 5 to 5½ percent since the mid-1960s (Allocation 1985, pp. 104-105, 109). However, this is a measure of change in the value of resources entering the R&D process, not an indicator of the growth of R&D output. It is possible that the high command was not satisfied on this score and wished to see an intensification of the pace.²³ The closest Soviet published materials have come to expressing such a view is contained in an article by Army General I. Pavlovskii (1978, p. 36), the commander of the ground forces and a deputy minister of defense.²⁴

The interests of combat readiness of the USSR Armed Forces and of the reliable defense of the Soviet state require that there should be no relaxation (*oslabliat'*) on the scientific research front, that research and experimental-design work on creating (future) models of arms and combat equipment should be continued, that the times (taken) to introduce research (results) into production should be shortened.

This is especially important now when, as a result of the intensifying scientific-technical revolution, the army and navy's material base is fundamentally changing, increasingly expensive weapons are appearing, and the obsolescence of military technology is accelerating. Therefore, planning organs at all levels should provide and do everything possible so that leading branches of industry constantly insure rapid modernization of equipment and create new-in-principle weapons. Research institutes and design bureaus, in developing future models of military equipment, should penetrate more deeply the secrets of the future, carefully evaluate the trends and laws of development of arms, correctly analyze the consequences of such development, and take into account the technical achievements of related branches of the economy. On the whole we

²²The authors of this work believe, however, that the Soviet Union would be "ready to conduct offensive operations in less than 60 days" after mobilization of reservists is begun.

²³As noted earlier, the rate of increase of military R&D outlays may have fallen off sharply in 1984.

²⁴I learned of this article from RAND colleague Larry Caldwell, who credits Myron Rush.

must now consider that questions of scientific forecasting, comprehensive long-term planning, and the determination of the optimal relation between different types of arms and military equipment acquire paramount significance and are a most important factor of the combat might of our armed forces.

There is no direct criticism levied at any of the institutions mentioned in this passage. There is also a certain wistfulness in the call to "penetrate more deeply the secrets of the future." Perhaps the whole citation is only standard agitprop, but writing in a period of tightening resource availability, after the decision to drastically cut the growth rate of investment in the 10th FYP, Pavlovskii may have echoed high command nervousness about the economy's ability to sustain the pace of R&D required by the "intensifying scientific-technical revolution."

If Pavlovskii's reference is somewhat obscure (or perhaps even misleading), there is no mistaking Ogarkov's warnings about the rapidity of technological change in nonnuclear weaponry. Clearly, Ogarkov was worried about Soviet ability to keep up in the technological competition. But where precisely was the difficulty and hence in what set of measures lay the remedy? More resources perhaps, but resources for what?

As noted, R&D outlays had been increasing since the mid-1960s at about 5 to 5½ percent per year in real terms, in CIA's estimate. In current prices, the rate of change would probably be a minimum of 7 to 8 percent. It is not known how R&D outlays figure in high-level Soviet discussions of military economics. The financing of R&D generally is part of social-cultural measures in the government budget, and probably only the expenditures of the MOD's own R&D institutions are included in the MOD budget (or "estimate," in Soviet parlance). An accounting of the military elements of outlays by the Academy of Sciences, branch R&D institutions (mostly in the VPK-supervised ministries), and higher educational institutions would have to come from the various organs regulating science in the first place—the State Committee for Science and Technology, the VPK, the Academy—compiled and assembled by TsSU. The MOD would have had difficulty in developing an independent viewpoint. Nevertheless, from whatever information at his disposal, Ogarkov may still have found fault with the quantitative picture. Possibly, he wanted more R&D institutions involved in the search for usable military high technology, more access to scarce materials and equipment, more qualified scientists and technologists, in short a more rapid expansion of the R&D resource base.

One may speculate that Ogarkov's dissatisfaction lay not only with the level or growth rate of military R&D outlays but also, perhaps even mainly, with the process of weapons development and acquisition. The

Soviet system had developed over the course of decades into a reliable instrument of developing and procuring large volumes of standardized systems distinguished more by effective design than by sophistication of technological level. Modernization took place incrementally through gradual generational replacement; it was augmented by upgrades between generations, utilizing technology that matured after the initial system design had been fixed. Early freezing of system design and restriction to proven technology was in fact one of the key features of the system, constraining the duration of development and enabling readier mastery by industry of the production prototypes. Production technology also tended to be simple, relying heavily, for example, on general purpose machine tools. Once serial or mass production had been prepared through standard processes, output tended to move down predictable learning curves.

To Ogarkov, who believed that weapons became obsolete after a dozen years, the whole process must have seemed dangerously cumbersome. If the existing system had been a suitable response to the demands of the 1950s and 1960s, it was increasingly dysfunctional as the "scientific-technical revolution" accelerated. Soviet military development was not simply a matter of copying Western advances, certainly not in design, but to a very large extent Soviet weaponry lagged behind that of the West. Ogarkov probably feared that this was no longer good enough, especially where quantity was increasingly less capable of compensating for deficiencies in quality.

One may therefore speculate that Ogarkov's complaint under the heading of the modernization of conventional forces had a lot more to do with the philosophy, organization, and management of military R&D than it did with just money. In the interests of strengthening capabilities for research and experimental development, he may have been arguing for greater integration of the USSR Academy of Sciences with the branch institutes and design organizations of the military ministries.²⁵ Because technological frontier-busting in the USSR has required the highest priority and massive state intervention (e.g., in nuclear weapons and rocketry), he might well have been demanding a much larger share of the Party and state's scarce management resources, not to speak of the nation's material resources. It would not

²⁵This may have been in Grechko's mind when he argued for a "unified military-technical policy" of weapons development (Weickhardt, 1986, p. 202), although Julian Cooper (1986b, p. 227) regards the term as standard boiler plate.

be surprising if, as a consequence, he also sought a larger role for the high command in national security decisionmaking.

Ogarkov's concern would probably not have been limited to R&D institutions but would also have encompassed production, and not just assembly but also the production of components, parts, and materials. It was indicated that the military acquisition system of the 1950s and 1960s was based on quite simple production technology. In the 1970s change was introduced. Conscious of the tempo of technological change in the West, perhaps also of the poor showing of Soviet weapons in Middle East wars, Soviet leaders promoted a double modernization effort in both weaponry and production technology, the latter intended to meet the requirements of modernizing military hardware. However, the progress of industrial modernization was uneven, with particular deficiencies in the qualitative level of machine tools, computers, and electronics (CIA, 1986b, pp. 31-33). These lags in modernization of the production base were also responsible for delays in bringing systems into full series production, a nonnegligible factor in the slowdown of production and procurement in the late 1970s and early 1980s.

IS THE PROCUREMENT SLOWDOWN REAL?

Finally, we must confront the question of whether the CIA estimates of the last few years are misleading guides to the development of Soviet perceptions and policy. This could be true even if the CIA estimates were correct, in the sense that the underlying prices and quantities were authentic representations of Soviet reality and were put together by a defensible methodology. If Soviet analysis and decisionmaking were based on other frameworks, outlays at current prices and output or procurement at "comparable" prices, the growth patterns displayed in Moscow would have been quite different from those appearing on CIA computers. It has been suggested that this may have been the case, but that a CIA-like estimate could also have been obtained, and the Party-military conflict over resource allocation may have been fueled or supported by just such a divergence of statistical outlooks.

The alternative is that CIA estimates are in substantial error for one or another reason. CIA and DIA are now in almost total agreement on the physical quantities of production as a consequence of a detailed interagency reconciliation effort. Prices still remain an issue between them and between CIA and some of its nongovernmental critics. The chief bone of contention between CIA and DIA is the particular use of learning curves for developing prices of systems whose production costs

decline with time (Allocation 1985, p. 103). Some nongovernmental critics (Lee, Rosefielde) have faulted the adequacy of CIA's allowance for quality change in setting ruble-dollar ratios, which are used to convert dollar cost estimates of advanced Soviet systems to constant-ruble outlays.²⁶

The effect of the second category of error would certainly be to understate the rate of growth of procurement as the product-mix shifted to more complex, sophisticated weapons systems. It is not self-evident what the effect would be of adopting the DIA philosophy of applying learning curves (where the constant-price weight equals the average cost of the production run up to the cutoff point of the time series), in place of the CIA procedure (where the constant-price weight is based on the average of the units produced in the year of measure). For systems long in production, the DIA's price will exceed the CIA's in the latter part of the production run, but the reverse will be the case for the early period. These two approaches will yield the same costs for the cumulative, complete production program of a single system, but different yearly costs. Because these yearly individual differences tend to be offsetting when aggregated with other systems, the overall difference is lessened, especially if new systems continue to be introduced at a steady rate. The latter condition, however, was less true in the late 1970s and early 1980s than earlier. Thus, it is not at all clear how a change in learning curve application now would affect the estimated procurement trend in that period.

If one were convinced that error had been introduced on one or the other account, the upward adjustment in the growth rate would, however, have to be substantial to overcome the downward pull of decreases in the *numbers* of major systems produced or deployed. Strode (1984, 1986) has assembled evidence that Soviet commanders at different levels were conscious of resource limitations imposed on the military effort. The procurement slowdown seems real enough, and it was probably perceived as such by the Soviet high command.

²⁶A critique of the CIA's methodology is far outside the mandate of this report. The interested reader is referred to Burton, 1983, and Correspondence, 1985, and the literature cited there.

III. GORBACHEV'S DILEMMA

Before my people, before you and before the world, I state with full responsibility that our international policy is more than ever determined by our domestic policy, by our interest in concentrating on constructive endeavors to improve our country.¹

Gorbachev came into office in March 1985 facing problems of internal political, social, and economic decay. Alcoholism, corruption, deteriorating public health, a stagnant economy, nationalist unrest, and generally plummeting morale suggested to him an incipient domestic crisis of major proportions. Gorbachev clearly viewed the internal crisis as his priority concern, but he also had an external challenge on his hands. The American military revival was in its tenth year and the buildup had been particularly rapid for the past four years. Added to that was the SDI program, announced two years earlier and then just gathering momentum. As he made clear on numerous occasions, Gorbachev wanted to be able to concentrate on internal reform and therefore needed a stabilization of the external military threat. Could he secure that through negotiation or other political means? If not, he would presumably feel compelled to respond in kind, in part or in full. But given the drag on the economy imposed by the ongoing military effort, could he afford to do much more without compromising his domestic program—economic in the first instance, but the social and political as well?

This was Gorbachev's defense economic dilemma, widely understood in the West and probably among Soviet elites as well. Of course, the dilemma was not created with his accession but developed over at least the previous decade, as growth plummeted, the leadership crisis turned acute, and the Western political-military challenge mounted. The nature of the options had not changed, but by the mid-1980s the trade-offs had deteriorated.

¹Mikhail Gorbachev, to an International Forum on Peace and Disarmament, Moscow, February 16, 1987, *New York Times*, February 17, 1987.

DEFENSE AND THE 12th FYP

For several years, the U.S. intelligence community, particularly DIA, appeared to expect resumption of the fast growing rate of Soviet defense spending, especially of procurement, that it had estimated for the first decade of the Brezhnev period.² It seemed difficult to believe that the procurement plateau would continue indefinitely. At the same time, the community recognized that a Politburo decision to step up military spending would be fraught with serious economic, political, and social consequences. What can be said then about Gorbachev's policy and actions since he has come to power?

When Gorbachev assumed the general secretaryship he undoubtedly already had in hand a fairly detailed military development blueprint for the 12th FYP. The draft of the economic plan's guideline control figures was available no later than the early spring of 1985, when the Politburo reviewed it. Because the major economic targets cannot be set until the military development goals are determined and translated into resource requirements, the military part of the plan must have been ready no later than the first quarter of 1985 and probably even earlier. However, the Politburo did not accept the first variant of the economic plan brought before it, or even the second. In fact it turned down three variants before it declared itself satisfied (Hewett, 1985, pp. 286-287). Considerable changes were therefore introduced into the original version.

Perhaps the military targets were changed at that time as well. There is obviously little evidence on this issue. Gorbachev's explanation for the Politburo's demandingness indicated that the main issue was higher output and productivity growth rates, and this might have implied the necessity for some cutback in military requirements. Gorbachev was the junior man on the team, however, in experience as well as age; he had no military or military-industrial experience; he may

²Allocation 1983, p. 21 (DIA: "[T]he intelligence community is in agreement that there is going to be an upward trend in the growth of these forces in the next few years"). See also DIA production projections for 1983-90 in Allocation 1983, pp. 204-205. In November 1984, CIA indicated that the slowdown extended through 1982 but tentatively estimated that procurement had turned up in 1983. However, CIA also acknowledged that "for the last 2 or 3 years, we have seen the initial estimates for a year come down a bit with additional information". DIA in January 1985 maintained that the "rapid growth in the dollar value of major Soviet weapon systems evidenced in 1983 has continued into 1984" (Allocation 1984, pp. 7, 8, 14, 123). In March 1986 the two agencies presented a joint paper in which divergent positions were expressed: CIA believed that procurement continued flat in 1982-84 while DIA estimated a growth rate from 1982 through 1985 of 3-4 percent per year (Allocation 1985, pp. 16, 36). The CIA and DIA joint paper of March 1987 reflects a unified position that procurement grew in real terms by 3 percent in both 1985 and 1986; nothing is said about the immediately preceding years (CIA-DIA, 1987).

well have won the office on a divided vote;³ and he did not yet control the Politburo. These factors, along with his determination to effect significant change in domestic matters, might argue that Gorbachev was unwilling to tread unnecessarily on sensitive military toes, at least for a while.

There is a strong likelihood that the military plan of early 1985 did not propose a major step-up in spending. If the draft defense budget bore the imprint of Chernenko's views, it must surely have reflected a restraint on defense growth. Throughout Brezhnev's last years and in his own fleeting moment of power, Chernenko made evident his reluctance to sacrifice consumption for defense. Gorbachev may also have had a voice in determining the draft budget's general framework, because he was the de facto General Secretary at least by the winter of 1984-85. Even if he was concerned about the security threat from the West, he might well have wished to ascertain first whether it could be constrained by political means before draining valuable resources away from the economic programs in which he was clearly most interested. With Chernenko evidently on his last legs, such an opportunity probably did not seem far off.

The published materials on the 12th FYP naturally provide almost no direct information on the targets for the military sector. In presenting the final version to the Supreme Soviet (*Pravda*, June 19, 1986), Ryzhkov devoted one sentence to military production: "The scale of physical output envisaged in the five-year plan makes it possible to maintain the country's defensive might at the necessary level."⁴ It is therefore necessary, as with previous Soviet plans, to look for indirect evidence.⁵

³Radio Liberty reported on January 31, 1987 ("The USSR This Week," RL 45/87) that according to an article in the Soviet mass journal *Ogonek*, opponents of Gorbachev had tried to elect Viktor Grishin to the general secretaryship in March 1985.

⁴At the 27th Party Congress, Ryzhkov also contented himself with one sentence, assuring "full provision of the Soviet armed forces with everything necessary for defense of the motherland." *Pravda*, March 4, 1986.

⁵The 1986 "defense" budget was maintained at the 1985 level and the 1987 allocation was to increase by 1 percent, but the significance of these actions remains murky, in view of the unreliability of the official figures.

Some analysts have drawn attention to the planned rise in the share of the accumulation fund in national income, from 25.9 percent in 1985 to 27.6 percent in 1990 (according to Ryzhkov at the Supreme Soviet in June 1986), as signaling an acceleration of defense spending. Although it may be true that procurement is to be found in the accumulation fund, if it is in fact counted in published national income data, accumulation is dominated by net investment in fixed and working capital. Given the more rapid rate of growth of investment compared with national income and the determination to cut the volume of unfinished construction, it would not be surprising to have a substantial increase in the share of net fixed investment in national income. This must have been even more marked in 1986, when the original annual plan called for an increase of

It is not easy to draw firm conclusions from such an examination. The Plan is ambitious with respect to output growth rates, calls for very substantial investments in both consumer and producer sectors, and generally provides for rapid progress along a broad front. The output of Group A industry (supposedly, producer and military goods) is scheduled to increase by 4.4 percent per year, but that of Group B (consumer goods) is to grow by 4.9 percent. However "heavy" industry (machinebuilding; fuel and energy; metallurgy; chemicals; timber, wood, pulp and paper; construction materials) is slated for a still larger increase, 5.0-5.1 percent. Machinebuilding (hereafter, MB) itself has an output target of about 7.4 percent, with the five-year total investment in MB planned to rise by 80 percent over the 1981-85 volume, compared with a 24 percent increase for total investment.

An effort to unravel the military-civilian breakdown of investment in MB in the 12th FYP (see App. B) is inconclusive. From the plan's general targets, the rapid rates of planned increase in output and investment could mean considerable expansion of the military sector. However, the spirit of the plan's industrial provisions is restructuring of the material, technical, and human factor foundations. In MB the emphasis is chiefly qualitative—transforming the structure of output, technical standards, and technical progress. Again, this does not preclude rapid growth of military MB, but the published draft's language and spirit seem to look rather to reequipping heavy industry as rapidly as possible.

Finally, the 12th FYP provides for spirited growth of annual operating outlays on "science," about 5.9 percent per year (one-third in five years), and of the five-year volume of investment in science, 70 percent. Roughly half of all Soviet outlays on "science" are believed to be devoted to military R&D. If these targets are approximately global in scope, there might be considerable room within them for expansion of the military component.

GORBACHEV'S VIEWS

From his first days in office as general secretary—indeed, even during Chernenko's last months (e.g., *Pravda*, December 11, 1984)—Gorbachev has made clear his driving concern to revitalize the Soviet

total gross investment of 7.6 percent (*Pravda*, November 27, 1985), which was subsequently raised to 8.4 percent; actual gross investment rose 8 percent (*Pravda*, January 18, 1987). Moreover, the planned cuts in consumption of alcoholic beverages, which are heavily taxed and therefore account for a significant share of consumption, might also be a factor in raising the weight of the accumulation fund.

economy and to transform its character. In his multiple restatements of this position, from various rostrums and in various forms, Gorbachev has also drawn attention to the historical significance of that task. In the April 1985 Party Plenum (*Pravda*, April 24, 1985), he said: "The country's historical destiny and the position of socialism in today's world depend in large part on how we handle matters from now on." In Leningrad a month later (Radio Moscow, May 21, 1985; FBIS SOV, May 22, 1985, p. R4) he told his listeners that the USSR could not indulge in the luxury of relaxing into a quiet life, because "history, if nothing else, is not giving us an opportunity." At the June 1986 Party Plenum (*Pravda*, June 17, 1986), he defined the *political* task of the 1986-90 period:

to restructure our economy, create a modern material and technical base to ensure the faster development of Soviet society, and a solution of major social tasks and reliable defense of the country. Time will not wait for us. Everything that we have planned must be done in time, for the point at issue is the might and prosperity of our power, the positions of socialism in the international arena and the consolidation of peace throughout the world.

At the 26th Party Congress he spoke of the need for radical reform of the society. By the middle of 1986 he was using the term "revolutionary" for the scale of change needed. In January 1987 he combined the two (Radio Moscow, January 27, 1987; FBIS SOV, January 28, 1987, p. R9), demanding

a radical turn and measures of a revolutionary character. As we talk about reorganization and associated processes of deep-going democratization of society, we mean truly revolutionary and comprehensive transformations in society.

We need to make this decisive turn because we just don't have the choice of another way. We must not retreat and we don't have anywhere to retreat to.

During the first two years of his regime, Gorbachev's references to the armed forces, to their achievements and nurturing, and to the question of the military budget were brief and grudging.⁶ He denounced imperialism and American appetites for military superiority, but on military resource allocation he rarely went beyond the blandness of "We will continue to spare no effort to give the USSR Armed Forces everything for the reliable defense of our fatherland and its allies, so that no one can take us unawares" (*Pravda*, April 24, 1985). He

⁶Rumors circulated in Moscow in the summer of 1985 that Gorbachev warned the regional military leaders assembled in Minsk in July that he was going to cut the military budget. See, e.g., Herspring, 1986a, p. 311.

pursued a militant arms control policy and in the process pushed the Brezhnev "Tula line" into new territory, where "concern for national security now demands the most scrupulous considerations of the security interests of other states" (Radio Moscow, June 6, 1986; FBIS SOV, June 9, 1986, p. G2).

A more concrete indication of his commitment to the priority of economic over military development was the increasing conscription of defense industry to aid civilian production. This is an idea whose postwar origins go back to the brief Malenkov regime in 1953-54, but they are most prominently associated with Brezhnev's declaration at the 24th Party Congress in 1971 (Cooper, 1986a, p. 34). Gorbachev is carrying on with apparently greater determination. The plans for modernization and acceleration of high-technology MB output would be completely infeasible without the extensive cooperation of the defense industry. For example, computers are produced by the VPK-controlled Ministries of the Radio Industry, Electronics Industry, and Communications Equipment Industry (Cooper, 1986a, p. 37); a high proportion of all electronics used throughout the economy comes from the Ministry of Electronics Industry; and so on. At the June 1985 conference on science and technology, Gorbachev announced his intention to make full use of defense industry experience. The guidelines of the 12th FYP demand a substantial increase in consumer durable production from defense industry. Presenting the draft of the plan before the Supreme Soviet in June 1986, Ryzhkov declared that all MB, including its military component, would be enlisted to expand light industry output. According to Lev Zaikov, Politburo member and probably the Central Committee secretary in charge of the military economic sector (*Pravda*, June 29, 1986),

It has been decided that the military branches of industry will not only take an active part in the production of civilian and nationally needed goods, but also combine it with the technical reequipping of light and food industries, public services and trade.

Gorbachev expressed the same idea more colorfully three months later (Radio Moscow, September 19, 1986; FBIS SOV, September 22, 1986, pp. R3-4):

[E]veryone has got used to being able to sell off any old machinery to agriculture, just junk, and the attitude is the same for the food industry, and even for light industry. Thus we have decided to instruct the defense ministries to help light industry, the food industry and the rural sector to resolve certain issues, to get rid of bottlenecks. They tell us, listen, it is easier to deal with defense matters and go into space than to improve the technical level of looms, or to make

machinery for the food industry. It seems you need enormous qualifications and real design talent, you see, to deal with these tasks.

Those qualifications were found in the defense industry. "We have all been brought up to respect defense and heavy industry." Now let their talents be applied to the solution of the problem of reequipping consumer goods industry.⁷

Finally, it is necessary to consider the significance of Gorbachev's arms control policy during this period. This is not the place to present a detailed review of his activities in this sphere, but a few highlights may suffice: In March 1985 the Soviet Union returned to the Geneva negotiations it had unilaterally broken off in November 1983; Gorbachev has proposed sharp reductions in both strategic and theater nuclear capabilities, in contrast to the refusal of the Brezhnev regime to consider markedly smaller cuts; the pursuit of arms control agreements induced the Soviet leader to meet with President Reagan in Geneva at the end of 1985 without any promise of U.S. concessions on the issue of Strategic Defense Initiative; in early 1986 and again at the Reykjavik summit, Gorbachev proposed complete denuclearization of both sides' forces; by mid-1987, Moscow had accepted the "double-zero" concept of a complete ban on intermediate and shorter range missiles. This energetic arms control diplomacy does not imply any particular limits on military spending, but because of its clear departure from earlier, bitterly defended Soviet positions it suggests that the Gorbachev Politburo may have overruled the views of the Soviet high command. Such a development could be consistent with continuing to maintain a fairly tight rein on military spending.

Gorbachev is a man in a hurry to reconstruct the political, economic, and social foundations of the society. It is true that the 12th FYP, and Gorbachev in speaking about it, proposed simultaneously to raise consumer welfare, accelerate economic growth, and strengthen defense. However, in the tens of thousands of words that issued from his mouth during his first two years, and in the actions of the regime accompanying them, it was apparent that his top priority was economic growth, followed by consumer welfare; the defense budget appeared a distant third.

⁷Almquist, 1987, Note 2, lists a dozen leading military-industrial personnel who were appointed to ministry-level posts in the civilian sector in the 1980s.

SOVIET MILITARY VIEWS ON THE GORBACHEV PROGRAM

Given the conflict between the high command and the Party during Brezhnev's last years and the 28-month interregnum, and in view of the strong commitment to arms control displayed by Gorbachev, the views of the Soviet military on Gorbachev's development program could be an important barometer of civil-military relations, particularly the state of the struggle over the military budget. Apparently, high-level military grumbling over resource allocation virtually disappeared from the Soviet media during Gorbachev's first two years in office. Perhaps this was evidence of support for the Gorbachev economic program. There are plausible reasons why the military might have been won over, at least for the time being, but there is an inevitable tension in that support that may erode the understanding over time. Moreover, recent events may have altered the climate of civil-military relations.

On one plank of the Gorbachev program, there is no reason to doubt the genuineness of military enthusiasm. The campaign to raise the level of discipline from the factory bench to the minister's cabinet must have unqualified military approval. Discipline is a favorite theme of military writing, and commanders cannot but rejoice when the party leader attempts to root out the corruption, lethargy, and alienation that have taken hold in the society over the course of decades. This was clearly the military reaction to the earlier incarnation of the discipline campaign, under Andropov. Marshal Petrov (1983), then chief of the ground forces, greeted it enthusiastically: The instruction "to launch an all-around campaign to strengthen labor discipline is especially close to the heart of us military people." The effects on the quality of recruits is hinted at in the following carefully crafted passage from a recent article in *Krasnaia zvezda* (Luzherenko, 1987):

When discussing discipline, we are aware that its vehicle is man. And man is changing. The people coming into the Army today are not the same as those of 30, 20, and 10 years ago: they are better educated and have broader technical and cultural horizons while at the same time they are less prepared for the difficulties of service and less experienced in the practicalities of life. This must be taken into account by officers, warrant officers, and ensigns in work to train and educate subordinates.

Further, the author writes:

Our Army is not divorced from the people but is very closely associated with it, and all the processes taking place in the country are reflected in the Army. From this standpoint, the measures taken by the party to enhance the level of discipline and organization in

society exert both a direct and indirect influence on strengthening discipline in the Army and Navy while, on the other hand, the efforts of civilians, political organs, staffs, and party and Komso-mol organizations to instill a spirit of high discipline in Soviet servicemen exert a tangible and beneficial influence on the state of discipline in labor collectives joined by military servicemen on their discharge into the reserves.

Thus, the armed forces and the Party are partners in an effort that promotes mutual interests. Marshal Ogarkov, who worried in print about Soviet youth and the strength of their patriotism, is probably also applauding.

On issues affecting resource allocation, however, it is hard to find "interesting" excerpts. Marshal Sokolov, the defense minister until June 1987, "had little to say on issues of major importance to the Soviet military" in the six years before he took over that office, and he was characterized as "a lightweight in the Soviet military hierarchy" (Herspring, 1986a, p. 299). Herspring (1986b, p. 531) observed that Marshal Akhromeyev, the chief of the General Staff, did not discuss the issue of the relation of the economy to the military effort, except to note its importance. His position on the adequacy of the military budget was to restate the Party line that "the USSR armed forces have at their disposal everything needed to successfully carry out the tasks entrusted to them." Denunciations of U.S. security policy remain abundant in Soviet military-political writings;⁸ these denunciations center on the refusal of the Reagan administration to accept the Soviet Union's arms control initiatives, thereby endangering international security. Some of the top level military leaders may also have serious misgivings about Gorbachev's arms control initiatives or his doctrinal innovations, but the expressions in print are reticent (Herspring, 1986a, pp. 303-307; Azrael, 1987, pp. 39, 42). The high command may, in consequence, be dissatisfied with its share of the state budget (Herspring, 1986a, p. 313) or fearful of the effect on defense spending of Gorbachev's civilian development commitments (Azrael, 1987, pp. 40-41); again, the public evidence of such sentiments is thin.

The failure of the military leadership to speak out more openly or more forcefully against Gorbachev's program may be ascribed perhaps to the effectiveness of party control over the military. However, the rapidity with which Gorbachev exploited the Cessna landing in Red

⁸A recent, typical example is in the Army, Navy Day interview with Army General P. G. Lushev, a first deputy defense minister (*Krasnaia zvezda*, February 23, 1987; FBIS SOV, March 12, 1987, p. V4): "[T]he aggressive imperialist circles of the United States and other countries have not abandoned their adventurist plans to crush socialism by armed force and take social revenge. . . . [They are] urgently preparing their armies and navies for aggressive acts."

Square in May-June 1987 to unseat Marshal Sokolov, the defense minister, and high ranking officials of Soviet air defense may indicate Gorbachev's belief that the incident provided a literally heaven-sent opportunity to assert his control. An intriguing alternative explanation presents itself: The military made an accommodation—although perhaps grudging—with the Gorbachev program. That acceptance would have been based on a consensus identification of the long term threat to Soviet security and the belief that the Gorbachev program held short term risks but also long term promise of considerably improving the Soviet military position.

In his Victory Day interview in 1984 (*Krasnaia zvezda*, May 9, 1984), Ogarkov had warned of the revolution in conventional technology that was in the offing and in which the United States was becoming fully engaged. By that time the threat of strategic defense in space had been added to the threat of information-based technologies of conventional warfare on land, on sea, and in the air, about which Ogarkov had written for many years. It was, however, in just these technologies that the Soviet Union lagged behind the West most conspicuously. Ogarkov was not alone among the Soviet military in fearing that the pace of technological change was accelerating while the ability of the USSR to keep up, burdened as it was by a backward economy under multiple strains, was seriously in doubt.

In effect, the Soviet Union finds itself racing in an outer lane of a circular track while its adversary has the advantage of an inner lane. The price of technical backwardness is the necessity to run harder, perhaps increasingly so. To escape this trap, the USSR must attempt to get closer to the hinge of the swing, to change lanes while at least remaining abreast of its competitor. On the running track this may not appear so difficult, but in the arena of arms competition the effort required is strenuous. The USSR must slow U.S. development or accelerate Soviet development, or both. SALT probably appeared to Soviet leaders as a means of doing the first, but the attempt was nullified by the collapse of détente. Because the pace of the military-technical revolution has speeded up in the late 1970s and first half of the 1980s, Moscow perceives a need to accelerate its own effort while making renewed attempts to constrain American and West European progress.

The foreign politics of constraint are reasonably clear—intensive arms control diplomacy is its spearhead supported by other efforts to distance Western Europe from the United States. How are the military economics of acceleration being decided? An immediate effort to match American achievements or programs could threaten the Soviet

civilian modernization program.⁹ The alternative is development of the industrial infrastructure that will make possible more sophisticated weaponry further down the road. The critical issue is that the priority areas of machinebuilding now being emphasized are of dual significance to both civil and military industry. The point is neatly set forth by Major General Yasyukov (1985, p. 20):

In the matter of strengthening military-economic potential, it is difficult today to overestimate the party's concern for cardinal acceleration of scientific-technical progress. After all, the leading directions of scientific-technical progress—the further priority development of machinebuilding, particularly machine-tool building, robot technology, computer technology, instrument-making, and electronics—are simultaneously the basic catalysts of military-technical progress.

Today what is required for serial production of contemporary weapons and the newest combat equipment is not usual or ordinary equipment but the most modern and frequently unique equipment—new in principal instruments, numerically controlled machine tools, robot equipment, latest generation computers, and flexible manufacturing systems. In other words, the present stage of the military-technical competition that has been imposed on us by imperialism demands a high level of development of those branches of industry with the best prospects, of the most modern technology, and of a highly qualified workforce.

A year later, General Yasyukov (1986, p. V2) reiterated the argument: "The backbone, the load-bearing wall of our country's defense capability is the Soviet economy." Therefore the program of "accelerated development, intensification, and increasing the efficiency of the economy objectively offers new potential for military building, too. The investment in the core high-technology branches of machinebuilding and other sectors that determine scientific and technical progress" enables the USSR "to react promptly to imperialist circles' attempts to break the military-strategic parity in their own favor."

Yasyukov is a political officer and may not be representative of the "real" military. Nevertheless, his argument may persuade. Over the

⁹The problem of "matching" can be subdivided into two main parts, the first dealing with SDI and the second with other high-technology weapons programs. Some Western observers believe the USSR could effectively and cheaply (compared with both the costs of the U.S. program and the size of the Soviet military budget) counter SDI deployments by limited multiplication of reentry vehicles on Soviet ballistic missiles. An effort to replicate the U.S. program would be much more costly. Other high-technology weapons programs would share many of the characteristics of the "emulation" response to SDI, particularly, the requirement in volume for scarce resources—skilled labor, high quality materials, and specialized machinery and equipments. These are also precisely the main ingredients of the high-technology machinery branches that are the focus of current modernization efforts.

preceding decade, Soviet growth across the board had slowed to a crawl. Resource allocation choices at the macrolevel, among the chief end uses of the national output, had become painful and generated party-military conflict. Shortages and bottlenecks, endemic in the civil sector, had spilled over to military production. Above all, the perennial problem of technical progress had become acute. Gorbachev's program would confront all of these issues. It is a plausible reading of the sparse evidence on military views but of the abundant evidence on Soviet difficulties to suggest that the Soviet high command could well have accepted a tradeoff of short term constraints on military production and procurement for increased longer term potential, especially in the quality dimensions.

In their 1987 joint presentation to the Congress, CIA and DIA estimate that procurement rose in both 1985 and 1986, by about 3 percent in each year (CIA-DIA, 1987). These estimates are subject to revision, although recent methodological improvements in CIA estimating procedures may have reduced the Agency's previous tendency to overestimate procurement growth in the year or two preceding the date of estimation. If the estimates of tangible increases in 1985 and 1986 hold, do they imply that Gorbachev's accession to power brought an end to the budgetary drought?¹⁰ CIA-DIA seem to dispute such a conclusion:

Although somewhat above the rate of recent years, it does not appear that this growth represents any change in defense spending policy since Gorbachev's arrival. Rather, it was largely driven by the start-up or acceleration of production of several new weapon systems that were under development before Gorbachev took office.¹¹

Production "start-up or acceleration," particularly the latter, is a policy decision that could have gone the other way and presumably did so often during the previous decade of roughly flat procurement levels. Nevertheless, the 1985-1986 increases, assuming they are roughly correct, do not necessarily imply a trend for the rest of the 12th FYP, although evidently there is sufficient industrial capacity in operation to sustain modest procurement growth (Allocation 1985, pp. 51-52):

Almost all of the production capacity required to support force modernization over the next six years or so is already in place. Our calculations suggest that virtually no additional investment in plant and equipment is needed to manufacture the military

¹⁰The indicated increases are still below those estimated by CIA and DIA for the period 1965-1975.

¹¹The reference is particularly to aircraft—initial stages of production of the Blackjack bomber and entrance of the MiG-29 and SU-27 fighters into the inventory—as well as missile procurement, especially the SA-10 and SA-12 air defense systems.

hardware that we believe will be in production in 1986-88 and that most of the capacity required to turn out the military equipment projected to be in production in the early 1990s is already available. Thus, military production would not be constrained in the near term by a reallocation of new fixed investment in form of civilian machinery and other priority sectors.

CIA and DIA did see room for civil-military competition over supplies of skilled labor, components, and materials. For example, skilled programmers are badly needed for modernization of civilian machinery production and in defense production too, but they are in short supply; the same is true of microelectronic materials and components; high-quality steel and energy will also be in great demand (Allocation 1985, pp. 52-53). The 1987 submission reaffirms the previous year's conclusion:

Although competition could be stiff for some basic materials and intermediate goods needed for both industrial modernization and weapons production—and might result in the delay or scaling back of some weapons systems—most major programs should go forward as planned.

Nevertheless, in 1986 the Director of Soviet Analysis, CIA, believed that (Allocation 1985, p. 119)

the question for the next few years is, how much of the capacity of the machine building section . . . will be used to build new machines, as opposed to how much of that capacity will produce weapons?

Some of the best quality machinery in precisely the areas of greatest development priority now—for example, flexible manufacturing systems and computer-operated machine tools—were allocated to military industry in the modernization effort of the 1970s. It will be a test of the contemporary status of the defense sector whether such critical resources are not diverted for the use of civilian machinery development as the pressures for plan fulfillment mount. Obviously, in the event of such diversion, the strains with the military leadership could mount.

This discussion concerns the orderly progress from development to production of the usual run of Soviet weapon programs, which modernize the weapon inventory over time, but fairly slowly. T-80 and other modern tanks will gradually replace T-62s, the SA-11 and 12 surface-to-air missile systems will replace the SA-4, and so forth in other branches and missions, bringing varying degrees of improvement in performance. But Ogarkov was not speaking of this pattern of development in representations that undoubtedly reflected much high

command thinking. Ogarkov's favorite catchwords were weapons based on "new physical principles" and he was seeking qualitative changes in the USSR's arsenal of conventional weapons (Azrael, 1987, p. 11). Such an objective could not but threaten the core of the modernization program, the high-technology MB branches devoted to electronics, computers, robotics, and the like. If the present-day Soviet defense establishment is seriously concerned with such weapon development, it has had to face up to the tradeoffs between near-term development attended by conflicts with Gorbachev's civilian priorities and possibly mediocre achievement, against deferral to a later point in the hope of capitalizing on the modernization program to match American performance standards. It is a reasonable guess that the Soviet military, with or without grumbling, has chosen the latter course.

SIGNS OF REVIVED CIVIL-MILITARY CONFLICT

The picture of a civil-military accommodation in the first two years of Gorbachev's term, despite the General Secretary's apparent commitment to nuclear arms reduction, must now be qualified somewhat in the light of events during the first half of 1987, when civil-military relations appear to have taken a turn for the worse. The armed forces and some of its leading personnel have come under unprecedented criticism. The turnover of personnel that had been in train in this as in other parts of the Soviet bureaucracy dramatically intensified after the landing of the West German Cessna aircraft in Moscow's Red Square on May 28. By the summer, most western observers believed that Gorbachev had asserted his and the Party's authority over the military in a fashion that had not been seen in the Soviet Union since Khrushchev.

Suddenly, the military have ceased to be immune to public criticism. After the January 1987 Central Committee plenum, party spokesmen attacked the armed forces for failing to take *perestroika* (restructuring) seriously (Davis, 1987, pp. 38-40). A round table discussion by Soviet intellectuals in *Literaturnaia gazeta* (May 13, 1987) found fault with the drafting of first and second-year college students as harmful to their intellectual and professional development (Hartmann, 1987). More astonishingly, a Belorussian writer denounced the legitimacy of second-strike nuclear retaliation (Moscow News, March 8, 1987). The military responded to the intellectuals' attacks with considerable heat (Hartmann, 1987; Foye, 1987). However, they have had to bend their necks to the storm of criticism that came in the wake of the Cessna incident, particularly the extraordinary tongue-lashing administered by Politburo candidate member Boris El'tsin, who is chief of the Moscow

Party (*Krasnaia zvezda*, June 17, 1987).¹² A month later the new Minister of Defense, General Dmitri Yazov, criticized the failure of the armed forces to eliminate "negative phenomena," charged that "certain of us have lost our sense of duty and responsibility," and demanded that "above all else we must put a halt to everything that is leading to the most flagrant incidents in terms of negligence, carelessness and irresponsibility" (*Krasnaia zvezda*, July 19, 1987; FBIS SOV, July 20, 1987, p. V1). In addition, charges of corruption, theft and other criminal activity have been levied at some officers.

Perhaps for the first time in a quarter of a century the military are being openly and sharply criticized. The attacks from on high, however, do not concern doctrinal or policy disputes as with Khrushchev, and they are not waged by indirection, as in the controversy with Marshal Ogarkov in the late 1970s and early 1980s. Now the denunciation is open and direct, and it concerns performance.¹³ The extension of "restructuring" to the military, which had appeared to be largely pro forma, now gets more attention and, apparently, more bite.

The relationship between these developments and the course of the Soviet military budget is not self-evident. Gorbachev has demonstrated a considerable degree of authority and power over the military. There has also been public criticism from the intelligentsia, extending to sacred issues of doctrine; and perhaps Gorbachev has not been averse to such displays. He is acutely aware of the opportunity cost of defense in terms of resources denied to priority civilian development. He will undoubtedly be wary of allowing the civilian modernization program to be threatened by "excessive" military demands. He will undoubtedly insist in military as in civilian affairs on utmost efficiency, on getting more "rumble for the ruble." Moreover, arms reduction remains the focus of his foreign policy to the West, and the prominence given to such "new thinking" formulas as "sufficiency" and "mutual security" also suggest reluctance to engage in renewed military buildup. Of course, Gorbachev must also be sensitive to the domestic and foreign politics of retaining the image of a powerful military capability. Greater control over the military does not resolve Gorbachev's military-economic dilemma, it only eases its political acuteness.

¹²For some Western reports, see Eaton, 1987; Keller, 1987; and Lee, 1987. Among El'tsin's more noteworthy charges were outmoded methods; allergic reactions to innovation; sham (*pokazushnost'*); self-satisfaction, boasting, and complacency; favoritism, nepotism, secretiveness (in personnel policies); and hoodwinking in combat training. El'tsin held the entire command of the Moscow Military District responsible for these deficiencies.

¹³Gorbachev has also proclaimed a "new thinking" in military doctrine. As suggested earlier, this may not sit well with some commanders and may yet evoke public, if perhaps disguised, resistance.

IV. CONCLUSIONS

A Moscow wit in the early months of Gorbachev's accession ventured that Marshal Ustinov had performed two great services for Gorbachev—removing Ogarkov from the post of Chief of the General Staff and passing away himself. The colorless Sokolov in part replaced Ustinov,¹ who had known Stalin and served the government, the Party, and the army for over four decades. In place of the charismatic Ogarkov, there came the capable but far less flamboyant Akhromeyev. Thus, Gorbachev was able to launch the campaign for civil economic acceleration and modernization without the threat of interference from dynamic, independent military chieftains.

Ogarkov remains sidelined from the center of political action but he would be justified in feeling partially vindicated. More than any other military leader he proclaimed the revolution of the new conventional military technology based on electronics, computers, and information science. Under Brezhnev and in the interregnum, only the first short steps were taken to develop Soviet capability in this area. The rhetoric of Gorbachev's program focuses on civilian modernization, but the civil-military duality is apparent and some military writers underscore it. It is, therefore, the Gorbachev program that may bring the Soviet Union to the threshold of exploiting the possibilities envisioned by Ogarkov.

"Politics is usually about relatively small choices on the margin of a much larger, untouchable whole," John Parker (forthcoming) has aptly noted. In a decade of muddle, Ogarkov refused to play the game in that fashion and was eventually removed from the central policymaking arena. Even from the political (but not military) sidelines, he may be gratified to see the end of that period of muddling through and the inauguration of a reformist politics, one that reopens the formerly "untouchable whole." Choices made at the margin are politically less stressful when key sectors of the economy and society are developing in healthy conjuncture. Gorbachev and his supporters often make reference to the lessons of Lenin's New Economic Policy (NEP), but the Soviet situation in 1985 bore intriguing resemblances to the picture drawn by the left industrializers in the late 1920s. Under the existing arrangements, the economy was beginning to stagnate. Unmet needs of consumption, investment, and defense could not be satisfied by

¹Sokolov took over the defense ministry but was only awarded a candidate seat in the Politburo.

marginal reallocations and that failure was threatening the state's external position, the society's future, and the security of the regime's foundation. To resolve one of these problems required a simultaneous attack on all; growth acceleration and sweeping modernization had to be substituted for resource shifts at the margin. This was the strategic essence of Gorbachev's vision; the rest was tactics.

In this abstract form and in principle, the military should have no problem with the Party's economic strategy, particularly given the enormous weapon inventories accumulated over the past decade or more. But the bargain suggested in the previous section, implicit or explicit, is likely to hold only as long as the conditions of the understanding are fulfilled: that the relative or absolute sacrifice of current security interests does not become unexpectedly large and that the bright promise of future military potential appears realizable. The General Staff might see the former condition violated if military production and procurement had to be cut back substantially to accommodate civilian needs or if Gorbachev were unable to constrain the growth of Western military power. Slippages in the economic modernization program or acceleration in Western military technical progress would erode the second condition. Despite the recent apparent strengthening of party control over the military, one would guess that Gorbachev's authority and possibly even his chances of political survival could also be undermined in the process.

Another dimension of the Gorbachev economic program, military-economic planning and decisionmaking, may make the high command uneasy, because it seems to accelerate processes that began under Brezhnev. Elsewhere (Becker, 1986a, pp. 49-50) it was suggested that the four chief foundations of military-economic organization in the heyday of Soviet military development were being undermined over time:

Priority in resource allocation had insured high quality resource inputs and helped insulate the defense sector against the vagaries of civil sector operation. However, in the last half of the 1970s the growth of defense sector outputs and inputs turned downward; major "target programs," dealing with complexes of economic branches (agro-industrial, energy, etc.) became line items in the national plan; several experienced, high-level defense industry managers were shifted to top positions in the civil economy; the military production sector was unable to seal itself off from the bottlenecks and shortages that became a more serious problem of the civilian branches.

The principle of *continuity of funding* was at least bent by the prolonged slowdown of Soviet defense spending. Investment in military industry also slowed with the retardation of overall investment growth.

The *close tie-in of military R&D with military industry* has endured, but the adequacy of the military science and technology base came under sharp criticism. Despite the modernization efforts of the 1970s, the production infrastructure is viewed as lagging far behind that of the West.

Only *centralized control over the military development-production process* remains unchallenged and enduring. Even here, however, the regime seeks to extend the benefits of the demanding customer, so central to the military-economic model, to important civilian sectors by the erection of such bodies as the coordinating bureaus under the Presidium of the USSR Council of Ministers for machinery and the fuel energy complex, and by the extension of a new system of factory quality control conducted by state inspectors (Gospriemka). Such action continues the process of diffusion of priority that is now accentuated by Gorbachev's promotion of high-technology machinebuilding.

We have come to appreciate that even in the first decade of the Brezhnev period the civil and military branches of Soviet industry were separated not by a Chinese wall but by a more loosely constructed barrier. The movement of resources and knowhow tended to be in one direction, from civilian to military, and was effectively controlled by the institutions of military-economic decisionmaking, particularly the VPK. Nevertheless, military machinery ministries produced substantial volumes of civilian goods; the input-output relationships between the producers of military end items and their suppliers became more complex and more wide-ranging; and the VPK ministries came under pressure from the early 1970s to cooperate in raising efficiency and quality in civilian industry. Now Gorbachev has brought extraordinary emphasis to the group of dual-use, high-technology machinery branches and has intensified the pressure on military industry to share the burden of tasks in civilian industry. The distinctions between military and civil industry are likely to become fuzzier, the barriers between the sectors turning into more permeable membranes. The function of the VPK may become less that of overseeing a definable group of industrial branches than of coordinating the stages of development and production sustaining a set of final military goods and services. In the process, there could be an increasing problem of "turf" between the VPK and the civilian machinebuilding bureau. Thus, the erosion of military priority and the requirements to cope with the "revolution" in military technology can feed back upon each other.

The Gorbachev machinebuilding modernization effort may be able to advance the production technology of military industry and the capital infrastructure of military R&D. But two caveats are worthy of mention. The current program apparently does not plan for major reliance

on imported Western technology. There is no public evidence on the volume of resources and attention that are to be devoted to the covert programs of securing Western technology, and perhaps they will be maintained or even increased. However, to this point Gorbachev displays considerable ambivalence on the subject of overt imports of Western technology, largely out of fear of political and economic dependence (Becker, 1986b). Whether this attitude will change remains to be seen: It may be especially stressed if "autonomous" modernization should appear to lag substantially behind current projections.

A second consideration concerns military R&D. A successful machinery modernization program may, as noted, have important effects on the capital structure of military R&D, but it is unlikely to do much for the R&D process itself. For someone like Ogarkov, who was concerned about the rapid obsolescence of weapons under the acceleration of the "scientific-technical revolution," the orderly but slow-paced process of weapon development and acquisition may have seemed even more a problem than the level of budget support. Here Gorbachev's reforms of enterprise organization incentives will be critical. So far, even by Soviet admission, there has been little effective change. Again, it will take some time before we can tell how successful the effort can be. But unless considerable progress is made, Ogarkov's fears of a dynamic West outpacing the clumsy Soviet machine could be realized.

Finally, the first half of 1987 brought signs of open strain between the military and the intelligentsia, between the military and the Party. The armed forces were humiliated by failure of the Soviet air defense, perhaps even more by the public vitriolic scolding from some major Party leaders; the air defense forces were extensively purged. One can only guess at the resentments these events may have left and at their possible importance in army-Party relations in the next few years.

Two and a half years, then, into Gorbachev's time at the Soviet helm, one may postulate that on the issue of resource allocation, army and Party have a *modus vivendi* erected on the promise of Gorbachev's internal and external policy. But the agreement does involve a continued acceptance of short term risks that in some military views have been mounting for close to a decade. And the climate of military-Party relations has become harsher. Gorbachev's maneuver space is therefore not unlimited, and an inability to make good on his promises could well rekindle the smoldering embers of Party-military conflict.

Appendix A

SOVIET EXPORTS, PRODUCTION, AND PROCUREMENT OF ARMS IN THE 1970s AND 1980s

It is difficult to develop an extended time series of Soviet arms exports. CIA regularly publishes estimates of deliveries to noncommunist developing countries (apparently including Ethiopia and Afghanistan) but not to the Warsaw Pact or to other communist states (e.g., CIA, 1986a, p. 111). ACDA (the U.S. Arms Control and Disarmament Agency) estimates total arms deliveries, including to communist states, but only for changing intervals (e.g., 1967-76 in ACDA, 1978; 1975-79 in ACDA, 1982; 1979-83 in ACDA, 1985). DIA has now reported arms deliveries to all recipients, but only for two periods, 1974-79 and 1980-85 (Allocation 1985, pp. 19-20 and 112-113). The DIA figures in 1984 dollars are \$70.9 and \$75.5 billion respectively, averaging \$11.8 and \$12.6 billion annually. The difficulty of drawing conclusions from these data, which cover different time periods, have different price weights and perhaps reflect different estimating methodologies can be gauged from Table A.1. ACDA and CIA estimates for the noncommunist countries approximately coincide, however, and on this basis perhaps the same can be assumed for the two agencies' estimates of transfers to communist countries. Allowing for the difference in time period, the ACDA and DIA estimates of total sales in current prices for the mid and late 1970s are also not too far apart.

Table A.1 suggests that for most of the 1970s Soviet arms transfers were increasing rapidly, at least in nominal value. This is clearly true of deliveries to noncommunist countries and probably of transfers to communist ones as well.¹ Judging from the sharp dropoff in deliveries to noncommunist countries after 1982 (CIA, 1986a, p. 111), the aggregate to all recipients must have been lower in the first half of the 1980s than in the previous five years. Thus, a 1984-dollar average annual value for all sales in 1979-83 (row 4 of Table A.1) probably would have exceeded the roughly \$13 billion per year transferred in 1980-85, perhaps by a substantial margin. It would not be surprising, then, based on these fragmentary indications, if the average annual real

¹ACDA, 1978, Table VII, indicates an average value of sales to communist countries of \$1.1 billion in 1967-76.

Table A.1

U.S. GOVERNMENT ESTIMATES OF SOVIET ARMS
TRANSFERS, VARYING PERIODS
(Average annual value, billion dollars)

	1974-79	1975-79	1979-83	1980-85
ACDA, current prices: ^a				
All recipients	5.4 ^b	6.7	11.3	11.2 ^c
Communist countries ^d	1.8 ^b	2.0	3.2	3.3 ^c
Noncommunist countries ^e	3.7 ^b	4.7	8.2	7.9 ^c
DIA, all recipients:				
1984 prices	11.8	n.a.	n.a.	12.6
Current prices	6.9	n.a.	n.a.	11.3
CIA, noncommunist developing countries, current prices	4.4	4.9	8.2	7.5

SOURCES: ACDA, 1980, Table IV; ACDA, 1982, Table III; ACDA, 1985, Table III; and ACDA, 1987, Table III; Allocation 1985, pp. 19-20, 112-113; CIA, 1984, p. 109 (1974 value); CIA, 1985, p. 109 (1975 value); and CIA, 1986a, p. 111 (1976-85 values).

n.a. means not available.

^aTotals may not equal sums of components because of rounding.

^b1974-78.

^c1981-85.

^dThe Warsaw Pact plus China, Kampuchea, North Korea, Laos, Mongolia, Vietnam, and Cuba.

^eAll others.

volume of Soviet military equipment exports rose by as much as a fifth or a quarter between 1974-79 and 1979-83. If the real volume of Soviet domestic procurement at the same time was roughly stable—CIA says that since 1975 the dollar cost of procurement has hovered at the level of \$60 billion in 1984 prices (Allocation 1985, p. 157)—exports would have been taking an increasing proportion of military output, unless the source of transfers was largely pre-1974 stocks.²

This conclusion can be partly supported with very limited cumulative data in physical units for the periods 1974-85 and 1981-85 shown

²There are considerable methodological problems in this comparison, apart from the fragile numerical basis of the calculation. In addition to the problem of joining current-dollar values to those in 1984 dollars, there is the difficulty of juxtaposing procurement and export values. The former represents an estimate of the U.S. cost of the Soviet basket, the latter is an estimate of actual transactions converted to U.S. dollars where required. An earlier CIA paper (CIA, 1978b) indicated that conversion to a U.S. cost basis would raise the level of the Soviet export series significantly.

in Table A.2. It would be useful if procurement and exports in the first two columns could be added to obtain production, which would then enable comparisons between 1974-80 and 1981-85. This is impossible for two reasons. The minor one is that there are imports of weapons, but these are small enough to be ignored in this calculation.³ More important is the issue of stocks: There is no evidence on the proportion of exports originating in stocks available at the beginning of the period. If the numbers in the artillery row in Table A.2 are all from the same universe, a considerable share of artillery exports must have come from pre-1974 stocks. However, the interval is fairly long, and a large portion of the exports over the 12-year period must have come from production in that period. Thus, even allowing for a substantial use of pre-1974 stocks, the export share of production appears to be high.

Table A.2

SOVIET PROCUREMENT, PRODUCTION, AND EXPORT OF MAJOR CLASSES
OF MILITARY EQUIPMENT, 1974-85 AND 1981-85
(Units)

Equipment	1974-85		1974-79	1981-85	
	Procurement	Exports	Procurement	Procurement	Production
Tanks	27,000	14,775	14,500	12,500	13,700
Fighter aircraft	7,800	5,600	5,400	2,400	4,850 ^a
Artillery	22,000	17,020	n.a.	n.a.	18,800 ^b
Helicopters	6,500	1,805	4,000	2,500	3,350
Submarines	110	18	70	40	46
ICBMs/SLBMs	3,500	(c)	2,700	800	1,300
Strategic bombers	400 ^d	n.a.	200	200	200 ^e

SOURCES: 1974-85—Allocation 1985, pp. 13, 19; 1981-85—Allocation 1985, p. 15 (procurement) and DOD, 1984, pp. 98-99, and DOD, 1986, pp. 113, 118, 120 (production); 1974-79—by subtraction.

n.a. means not available.

^aFighters and fighter-bombers.

^bIncludes multiple rocket launchers and AA artillery. Excluding antiaircraft artillery the number is 18,050.

^cn.a. but probably zero.

^dLong and intermediate range.

^eBombers.

³Imports are estimated by Vanous as growing from 0.3 billion rubles in 1970-71 to 0.8-0.9 billions in 1978-80 (see Bond and Levine, 1983, p. 302, col. 21 and p. 304). Exports (Table A.1 above) run 10 or more times as high.

Table A.2 also shows a direct comparison of production and procurement for 1981-85. This, however, has a puzzling gap between the numbers of missiles produced and procured, because it is highly unlikely that any were exported.⁴ In other categories, the comparison indicates that about 9 percent of tank production, 51 percent of fighter aircraft, 25 percent of helicopters, and 13 percent of submarines were not procured.

The most direct authoritative comparison of production over time comes from a graph in a CIA source (1986b, p. 6) showing indexes of output in terms of quantities of new units: Production of aircraft dropped about 8-10 percent in 1976-80 (after a roughly 40 percent increase in 1971-75) and then declined again, more sharply, in 1981-85. The number of ICBMs and SLBMs decreased continuously in these five-year periods, to a level in 1981-85 one-quarter as high as in 1966-70. Tank production was about a quarter below the 1966-70 mark in both 1971-75 and 1976-80 and somewhat lower still in 1981-85. Major surface combatant output was roughly steady until 1981-85, when it declined about 45 percent. Submarines were down 25-30 percent in 1971-75 and 1976-80 and perhaps 40 or 45 percent in 1981-85. Only artillery production in this tabulation grew, by 60-90 percent in 1971-75 and 1976-80, only to drop back somewhat in 1981-85.

⁴Most of the ICBMs and SLBMs had to be emplaced, of course, generating a lag between production and deployment, but to account for the gap in Table A.2 on this basis requires the assumption that after leaving the factory, the missiles entered an organizational limbo outside of procurement.

Appendix B

THE CIVIL-MILITARY DISTRIBUTION OF INVESTMENT IN MACHINEBUILDING

For the first time we now have an official clue to the military-civilian breakdown of investment in machinebuilding.¹ At the June 1985 conference on science and technology, Gorbachev said that civilian MB in the 11th FYP period (1981-85) accounted for only 5 percent of all productive investment. Since both the latter figure and investment in all MB are known (Narkhoz 1985, pp. 365, 368), the volume of military MB investment in 1981-85 can be calculated as about 42 billion rubles (BR), constituting 58 percent of total MB investment of 73 BR.

Two immediate pitfalls in this calculation are both related to the different organizational units of accounting in TsSU statistics. Did Gorbachev intend a ministerial or branch count of civilian MB investment? The former would represent investment in the 11 primarily civilian-oriented MB ministries, whereas the latter would count investment by all enterprises whose output was primarily civilian. Because this is a difficult distinction to make, one would guess that Gorbachev's figure referred to ministries. The other question is whether total MB investment is a ministerial or branch summation. The answer is not clear but is probably the latter, and the calculated military share of MB investment could be off considerably.

Assume, however, that 55-60 percent is approximately correct as this ratio. How is investment distributed in the 12th FYP? Here there are other mysteries. The 5-year total investment in MB was scheduled to rise by 80 percent over the 1981-85 volume.² Since 80-100 percent is the figure Gorbachev used in June 1985 to discuss the investment growth necessary for civilian MB, one would be inclined to associate the 80 percent FYP growth target with civilian MB.³

¹The Soviets distinguish metalworking and machinery repair from machinebuilding proper, all of which together are called machinebuilding and metalworking. Often, however, "machinebuilding" is used loosely to designate the whole complex.

²It is assumed that the 12th FYP investment figures refer to ministerial totals. If they do not, the uncertainties noted below are compounded.

³The target for MB investment in the 1986 budget is also stated explicitly to apply to civilian MB. Although Gosplan chairman Talyzin did not identify the scope of the same investment target in his speech on the 1986 plan on the same day (*Pravda*, November 27,

Ryzhkov declared that the 12th FYP volume of investment in MB would come to 63 BR. This figure could hardly be total MB if the sum of investment in civilian and military MB in 1981-85 was 73 BR. If 63 BR refers only to civilian MB investment, it is more than double the 1981-85 figure of 31 BR, rather than 80 percent larger. Does the 80 percent investment growth target then refer to the sum of civilian and military MB? If so, the 12th FYP investment total would be 131 BR and the military MB share would be 68 BR or 52 percent, down from the 58 percent share in 1981-85. The growth target for military MB investment would be 62 percent, but it would still imply a 1990 level perhaps twice as large as in 1985. In contrast, if Ryzhkov's 63 BR target really is all investment in MB, an 80 percent increase of the civilian component would bring it to 56 BR, allowing only 7 BR for military MB for the five years, less than the probable spending in 1985 alone. This would represent a drastic, unprecedented slash in the military's share of MB investment and seems distinctly unlikely. But perhaps other interpretations of the scope and meaning of these figures are possible.

The planned rate of growth of MB output was noted previously as 7.4 percent per year (43 percent over 5 years). The military share of total MB output is considerable, but the Western estimates differ widely.⁴ The published plan does not indicate the growth targets for the civilian or military components. Thus, it is not possible to replicate the planned growth of military MB.⁵

1985), *Vestnik statistiki*, 1986, No. 2, p. 50, declares that the target applies to 11 MB ministries. Both this source and the budget speech introduce another complication, however, by linking the civilian machinery investment target to the goal for MB output, 6.6 percent: Does the latter figure then also refer to civilian MB?

⁴Bond and Levine (1983, pp. 301-30.), estimated 16 percent for just military hardware (excluding durables commonly used in civilian activities) in 1980 and projected 17-22 percent in 1985; DIA claimed the share was 59 percent in 1982 (Allocation 1983, p. 7); Jan Vanous (*Washington Post*, August 17, 1986) used the figure of 44 percent for 1985; CIA has the lowest estimate, about one-quarter "in recent years" (Allocation 1985, p. 6). Presumably the chief reason for the considerable divergence is different methodologies. Bond and Levine "residualized" gross value of MB output statistics. DIA's figure undoubtedly derives from a calculation of the output of ministerial MB. CIA's approach has not been published.

⁵If investment in military MB is scheduled to roughly double between 1985 and 1990, military MB output would presumably increase rapidly too, although much of the investment could be slated for modernization rather than expansion of capacity. The polar case of sharp absolute decline in military MB investment would have to mean a freezing of military MB output at least, but more likely a decline in projected output.

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